PFAS Ongoing Monitoring Report (October 2021 – September 2022)

HMAS Stirling

304700525



Prepared for
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Cardno

now

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Executive Summary

Introduction

The Australian Department of Defence (Defence) engaged Cardno, now Stantec (Cardno) to implement the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) (RPS, 2018c)[1] at the Australian Naval Base His Majesty's Australian Ship (HMAS) Stirling, Western Australia.

The OMP outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, porewater, surface water and sediment originating from HMAS Stirling on Garden Island (the site).

The OMP includes sampling and analysis not only from Garden Island, but also from the marine nearshore environment surrounding the island. Garden Island and these surrounding areas are collectively referred to as the 'Management Area', as shown in Figure 2, Appendix A. The monitoring program consists of quarterly monitoring events at sample collection locations within the Management Area. Sampling under these different climatic conditions provides a better understanding of the movement and concentrations of PFAS in the environment.

Objectives

The objective of the OMP is to assess changes in the nature and extent of PFAS within the Management Area. The OMP used the monitoring network developed as part of the PFAS Management Area Plan (PMAP) to monitor the amount of PFAS leaving the site through the groundwater and surface water. The PMAP documented ways to manage potential risks to receptors (for example, to people or the environment) associated with Defence's historical use of legacy aqueous film forming foam (AFFF).

Monitoring Scope

The scope of work for the quarterly monitoring events (during the October 2021 – September 2022 monitoring period) included monitoring of 61 groundwater wells, 39 co-located sediment and porewater locations, and 28 surface water locations for PFAS concentrations as specified in the Sampling and Analysis Quality Plan (SAQP) (Cardno, 2022) presented in Appendix B. Works were conducted in general accordance with the SAQP except as summarised in Section 3.7 of this report.

The monitoring results showed that concentrations of PFAS at each monitoring location generally remained within the same order of magnitude as those monitored in previous monitoring rounds. Results from previous monitoring rounds can be found in the 2021 Annual Interpretive Report (AIR, Cardno, 2023) as well as the Detailed Site Investigation (DSI, RPS, 2018a)[2]

Groundwater Results

Groundwater Flow Direction

Groundwater levels within monitoring wells and groundwater flow direction for the October 2021 – September 2022 monitoring period were consistent with historical results. Geochemical parameters of groundwater (including but not limited to acidity, oxygen concentration, conductivity) showed no notable change across the different seasonal sampling events. The salinity in groundwater was observed to increase the closer the monitoring wells were to the coastline.

PFAS Concentrations

Generally, PFAS concentrations in groundwater were consistent with those found in previous monitoring periods. That is, the order of magnitude of concentrations did not change, suggesting that PFAS in groundwater is stable.

What is an 'order of magnitude'?

This refers to something decreasing or increasing by multiples of ten. For instance, an increase from 10 to 100 is an order of magnitude increase. When assessing changes in PFAS concentrations at an individual location, all concentrations are considered when determining trends, but order of magnitude changes are discussed separately as they represent a significant change in concentrations from what was reported in the previous event.

If a change is close to established health or environmental criteria, it will also be considered significant.

[1] The OMP is publicly available at https://www.defence.gov.au/about/locations-property/pfas/pfas-management-sites/hmas-stirling-garden-island, and is found as Attachment 1 of the PFAS Management Area Plan.

PFAS plumes are present in groundwater at several locations throughout the site, typically attributed to the historical storage and use of AFFF. Groundwater elevation data and analytical results indicate that the plumes are slowly moving towards the shoreline and away from source areas (Figure 2, Appendix A). Elevated concentrations of primarily Perfluorooctane Sulfonic Acid (PFOS) and the Sum of Perfluorohexane Sulfonic Acid (PFHxS) and PFOS were generally higher in source areas and lower in down-gradient areas and towards the shoreline. Perfluorooctanoic Acid (PFOA) concentrations across the monitoring network were generally reported below the laboratory limit of reporting (LOR) or marginally above.

To assess the stability and extent of PFAS plume migration in groundwater, Mann-Kendall statistical analysis (Mann-Kendall) was undertaken. This showed a significant statistical trend indicating the groundwater plume was migrating towards the coastline. This trend is supported by sampling conducted at coastal locations that showed new concentration maximums and exceedances (above adopted guideline values) as detailed in Section 7.

PFAS concentrations ranged from below the LOR (0.01 ug/L), and two orders of magnitude above the adopted criteria for the protection of recreational water users (2 µg/L). Isolated occurrences of results being outside the historical range of concentrations were identified (i.e. the data set had new minimum concentrations and new maximum concentrations). However, these were generally isolated occurrences, as PFAS concentrations returned to within the historically observed range during the following monitoring round.

Overall, the groundwater data collected during the monitoring period confirms the current understanding of the risk for the Management Area, which is that it is low and acceptable for human health and ecological receptors.

What is a 'limit of reporting'?

The limit of reporting (LOR) is the lowest concentration level that the laboratory is able to measure in a sample with a reasonable degree of certainty. Where monitoring shows <LOR, it means that if PFAS is present in the sample it is too low for the laboratory to measure with any degree of certainty.

Porewater Results

Porewater is water that is present between the individual grains of sediment (sand) in the coastal environment. It differs from groundwater as there is a mix of both terrestrial groundwater inflow and seawater recirculation with a zero net water flux. It is the interface between groundwater and surface water. The monitoring of porewater provides data to assess the potential risk of PFAS migrating to the surrounding waters off Garden Island.

PFAS concentrations in porewater ranged from below the LOR to 2.09 µg/L across the Management Area. The maximum concentration reported during the monitoring period is lower than the maximum concentration reported during the previous monitoring period. The analytical data obtained from porewater samples indicated the PFAS groundwater plume is being diluted due to nearby coastal tidal processes.

Potential risks to the human health of recreational users of the shoreline were considered to be acceptable given that only one porewater sample exceeded the adopted recreational use criteria of 2 ug/L. In addition to its isolation, the concentration only marginally exceeded the criteria and decreased to below the criteria in subsequent sampling events.

No changes or trends in PFAS concentrations were noted for the porewater monitoring locations with only infrequent detections above the LOR.

Surface Water Results

81% of surface water samples collected during the monitoring period did not possess detectable concentrations of PFAS where they were reported below the LOR. The highest concentrations of PFAS did not exceed the recreation criteria (PFAS concentrations in surface water ranged from below LOR to 0.23 µg/L) and potential risks to human health were not considered to be present.

No changes or trends in PFAS concentrations were noted for the surface water monitoring locations with only infrequent detections above the LOR.

Sediment Results

Sediment is also sampled to help inform the movement of PFAS in the environment.

20% of the sediment samples collected during the monitoring period were marginally above the LOR and no first-time detections of PFAS were reported. No changes in the nature and extent of PFAS in sediment were observed.

It appears PFAS is not accumulating within the sandy sediments at the section of coastline within the Management Area. Dilution with porewater/sea water appears to be occurring faster than any binding mechanism.

Risk Summary

A review of the sources, pathways and receptors as presented in the PFAS Management Area Plan (PMAP) (Defence, 2019) has been undertaken.

The findings within this report suggest that the nature and extent of PFAS in groundwater, porewater, surface water and sediment has not significantly changed compared to the results from previous monitoring periods. No new pathways, exposure scenarios or potential receptors were identified.

Based on the available data from previous monitoring periods and the current monitoring period, there is no significant change to the overall risk profile of the Management Area. No elevated risks requiring specific management actions were identified during the DSI (RPS, 2018a) and Environmental Risk Assessment (ERA, RPS, 2018b). The OMP data collected to date does not warrant a change to this conclusion. Additionally, based on the interpretive assessment undertaken as part of this report, the monitoring network, frequency, and parameters meet the OMP objectives.

Conclusions

The following conclusions are based on the data collected during the monitoring period:

- The October 2021 – September 2022 monitoring was undertaken in general accordance with the SAQP and is considered to have met the objectives of the OMP.
- PFAS concentrations in groundwater were generally of similar order of magnitude as historical data with higher concentrations detected within source areas and lower concentrations in downgradient area and towards the shoreline.
- Elevated concentrations of PFAS in porewater and surface water were observed downgradient of several source areas. The magnitude of concentrations in porewater and surface water were generally lower than those in groundwater, suggesting PFAS is diluted in seawater and dispersed by the energy intensive environment of the marine shoreline.
- The October 2021 – September 2022 monitoring data indicated no changes to our understanding of PFAS contamination on the site. The risks to human health and ecological receptors within the Management Area remain low and acceptable.

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Chemical Names

DOC	Dissolved Organic Carbon
DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluorohexane Sulfonate
PFOA	Per-fluorooctanoic Acid
PFOS	Per-fluorooctane Sulfonate
TDS	Total Dissolved Solids (salinity of water)
TSS	Total Suspended Solids

Technical Terms & Abbreviations

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AIR	Annual Interpretive Report
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
AST	Above-ground Storage Tank
BGL	Below Ground Level
COC	Chain of Custody
CSM	Conceptual Site Model
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environmental Protection Authority
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
ORP	Oxido-reduction Potential
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water level
SAQP	Sampling and Analysis Quality Plan
SWL	Standing Water Level
WA	Western Australia

Units

ha	Hectares
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
mV	Millivolt
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity - Water)

Site Specific

AVCAT	Aviation Carrier Turbine
OMIR	Ongoing Monitoring Interpretive Report
OMP	Ongoing Monitoring Plan
PMAP	PFAS Management Area Plan
FTA	Fire Training Area
HSF	Helicopter Support Facility
RCIP	Regional Contamination Investigation Program
WWTP	Waste water Treatment Plant

1 Introduction

The Australian Department of Defence (Defence) engaged Cardno, now Stantec (Cardno) to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) quarterly sampling events and interpretative reporting at the Australian Naval Base His Majesty's Australian Ship (HMAS) Stirling (the site) (Figure 1, Appendix A).

1.1 Background

The PFAS OMP (RPS, 2018c) outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, porewater, surface water and sediment originating from the site. The monitoring program consists of quarterly monitoring events generally conducted in March (Q1), June (Q2), September (Q3) and December (Q4).

The OMP applies not only to the site, but also the surrounding marine nearshore areas that, together with the site, make up the "Management Area". For the purposes of this report:

- The 'site' is defined as HMAS Stirling Garden Island (Figure 1, Appendix A).
- The 'Management Area' is defined as comprising of Garden Island and the marine nearshore environment (Figure 2, Appendix A).

1.2 Purpose & Objectives

The primary objective of the PFAS OMP is to establish trends in PFAS concentration in groundwater, surface water, porewater and sediment associated with seasonal variability to confirm the current understanding of the risk. To achieve this, the monitoring specified in the OMP aims to:

- Provide ongoing data on the concentrations of PFAS in groundwater, surface water, sediment and porewater within the Management Area.
- Establish the presence or absence of trends in PFAS concentration associated with seasonally variable rainfall and consequent changes in groundwater flow direction and height.
- Confirm the level of risk described in the DSI (RPS, 2018a) and ERA (RPS, 2018b).

The specific objectives of this Ongoing Monitoring Interpretive Report (OMIR) are to:

- Inform Defence and key stakeholders of PFAS trends in groundwater, surface water, porewater and sediment.
- Assess any variations in the distribution of PFAS for the Management Area and how this changes the understanding of the conceptual site model and risk profile.
- Make recommendations for any potential changes regarding the location and frequency of future sampling that may be incorporated into the OMP.

1.3 Scope of Work

The PFAS OMP was carried out in general accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP):

- Cardno, August 2022, Reference: DEF19009, Rev.7 *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling* (Appendix B).

The SAQP was reviewed and updated as required prior to each monitoring event.

Cardno carried out the following tasks to satisfy the purpose and objectives of this assessment:

- Quarterly monitoring of on-site groundwater wells (gauging and sampling); and
- Sampling of surface water, porewater and sediment within the Management Area on a quarterly basis.

The OMP outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, surface water, porewater and sediment originating from the site. This OMIR covers the monitoring period from October 2021 to September 2022.

1.4 Standards of Assessment and Limitations

This OMIR has been prepared in general accordance with the current industry standards for an assessment of this type for the purpose, objectives and scope identified in this report.

This report is not any of the following:

- A Mandatory Audit Report (MAR) or Voluntary Audit Report (VAR) as defined under the *Contaminated Sites Act 2003* (CS Act).
- A Geotechnical Assessment.
- A DSI.
- A Detailed Hydrogeological Assessment.
- A Remediation Action Plan (RAP) or Site Remediation & Validation (SRV) report.
- A Site Management Plan (SMP).

2 Site Setting

The site is located on Garden Island within Cockburn Sound, situated approximately 4 km off the Western Australia (WA) mainland and connected to the mainland via a bridge in the south of the Island. The Island is 12 km long and 1.5 km wide at its widest point and covers an area of 1,274 hectares (ha).

Defence facilities occupy approximately 28% of the Island, with the majority focused around Careening Bay on the southeast, with other support facilities located in other portions of the Island.

The buildings and associated infrastructure and support services include:

- Accommodation blocks.
- Helicopter Support Facility (HSF).
- Fire Station.
- Fuel Farm.
- Flammable / Hazardous goods and waste Storage.
- Aviation Carrier Turbine (AVCAT) Storage Facility.
- Wastewater Treatment Plant (WWTP).
- Seepage ponds.
- Shipping berths and ship sullage area.
- Maintenance and workshop areas.
- Demolition ground; and
- Fire Training Area (FTA).

2.1 Site Definition and Planning

The site location is presented in Figure 1, Appendix A. Key site identification details are presented in Table 2-12.

Table 2-12 Site Identification Details

Details	Description
Site Address	Garden Island, WA
Land Description	HMAS Stirling
Owner	Commonwealth of Australia
Title Details	Lot 9 on Plan 226190
Planning Zone / Land use	Public Purposes – Government Services / Naval Base
Local Government Authority (LGA)	City of Rockingham

2.2 Surrounding Land Uses and Zoning

The surrounding land uses are outlined in Table 2-13.

Table 2-13 Surrounding Land Uses

Direction	Land Use
North	Carnac Island Nature Reserve / Indian Ocean
West	Indian Ocean
East	Cockburn Sound / Kwinana Industrial Area
South	Warnbro Sound / City of Rockingham

2.3 Management Area Description

The OMP includes sampling and analysis from a number of groundwater monitoring wells, co-located porewater and sediment locations and surface water locations. The Management Area boundaries are presented in Figure 2, Appendix A.

The Management Area as described in the PFAS Management Area Plan (PMAP) (Defence, 2019) includes HMAS Stirling, Garden Island and the near shore marine environment surrounding Garden Island.

2.4 Environmental Setting

Key details defining the site are summarised in Table 2-14.

Table 2-14 Key Site Details

Setting	Description
Climate	The Perth region, including Garden Island has a warm summer, cold winter Mediterranean climate. Mean maximum temperatures on the Island occur in February (28.3 ºC) while mean minimum temperatures occur in July (11.2 ºC). Rainfall is winter dominant, with the highest volume of rainfall typically occurring in July with a mean monthly rainfall of 115.5 mm.
Topography	Topography on Garden Island ranges from sea level, 0 meters relative to the Australian Height Datum (mAHD) along the eastern coastline to 55 mAHD within the middle of the Island. Steep dunes and limestone cliffs of up to 10 mAHD characterise the western perimeter of the Island, whilst the eastern perimeter is relatively flat.
Geology	**Regional Geology** Garden Island is an offshore outcrop of Tamala Limestone and part of the Garden Island Ridge, the WA Department of Mines and Petroleum 1:50,000 geological map series indicates the surface is Calcareous Sand (S2 and S13) (i.e., Safety Bay Sand – white medium grained rounded quartz and shell debris well sorted of eolian origin). **Site Specific Geology** Logs from the drilling of groundwater wells and soil cores during previous sampling programs (ENSR 2009, RPS 2018a) indicate the geology of the site varies with topography. The Demolition Ground in the north coast of the Island contains Safety Bay Sand to at least 5 meters below ground level (mBGL), and at the WWTP Safety Bay Sands were encountered down to 29 mBGL. Layers of limestone were encountered in certain areas (e.g., Fire Training Area at 1-2 mBGL and around the WWTP at 7-15 mBGL). Fill sands containing brick rubble and limestone cobbles were also encountered in the Fire Training Area to a depth of 1 mBGL.
Acid Sulfate Soil	A review of the Acid Sulfate Soils (ASS) risk mapping, available on the WA Atlas online database indicates no known risk of ASS occurrence within three metres of natural ground surface for the site.
Hydrogeology	▪ **Groundwater Occurrence** – The superficial aquifer at Garden Island, whilst geologically connected, is not hydraulically connected to the superficial aquifer of the mainland as both discharge to the near shore marine environment. The underlying confined aquifers, the Leederville and deeper Yarragadee, typically extend tens of kilometres offshore beneath the seabed and are thought to discharge terrestrial groundwater to the ocean several kilometres from the coast (Davidson, 1995). At the south of the Island the superficial aquifer extends to a depth of around 20 mBGL, with an aquitard (Kings Park Formation) at ~90 mBGL, overlying the Kardinya Shale around 140 mBGL, overlying the Leederville aquifer at ~165 mBGL. In the north of the Island, the Kardinya Shale is present at significantly shallower depth than in the south (~37 mBGL) and forms an aquitard to the deeper Leederville Formation at ~181 mBGL. ▪ **Depth to Groundwater** – The depth to groundwater is affected by the topography of the Island. Along the coastline groundwater is found at shallow depth (2-3 mBGL), whilst around the WWTP groundwater is up to 21 mBGL. The depth to groundwater, especially along the coastal fringes, will be influenced by tides within the surrounding marine environment. ▪ **Groundwater Flow Direction** – Groundwater flow direction is interpreted to be towards the marine environment, with flow on the east of the dunal system towards Cockburn Sound and flow towards the Indian Ocean on the west of the dunal system. Tidal pressure can influence localised flow direction in the vicinity of the coastline.

Setting	Description
	▪ **Salinity –** The superficial groundwater is classified as brackish by the Department of Water and Environmental Regulation (DWER) Perth Groundwater Atlas, with a total dissolved solids (TDS) in the range of 500 – 1,000 mg/L. ▪ **Groundwater Use** – Groundwater is not abstracted on the Island for potable or non-potable use. Potable water for Garden Island is supplied from the Rockingham town water supply. The DWER groundwater database found two registered abstraction bores (Leederville Aquifer) on the mainland within 20 km of Garden Island. These bores are used for irrigation and industry. RPS ruled out any risk of PFAS impact to these bores according to the calculated groundwater travel time (RPS, 2018a).
Environmental Sensitive Areas	Due to its significant natural and cultural heritage values, the Island is protected by the *Environment Protection and Biodiversity Act 1999* (EPBC Act). Several vulnerable species of flora have also been listed as endangered ecological communities. The vegetation on the Island is also included in Bush Forever Site 63, with the Bush Forever policy providing a framework for bushland protection and management issues in WA. Additionally, the seagrass meadows along the eastern margin of Garden Island are a significant remnant population of seagrass in Cockburn Sound and are protected under the *State Environmental (Cockburn Sound) Policy 2015*.

2.5 Source Areas

Ten main source areas for PFAS contamination were identified during the DSI (RPS, 2018a) and associated with risks to receptors as identified in the PMAP (Defence, 2019):

- FTA.
- HSF.
- Demolition ground.
- WWTP.
- AVCAT storage, fuel farm and infiltration swale.
- Fire station.
- Dredged sediments.
- Ship sullage area.
- Flammable/hazardous goods and waste storage; and
- Accommodation area.

PFAS was detected in all media tested (groundwater, surface water, porewater and sediment). The highest concentrations in soil were observed in the source areas. PFAS concentrations in groundwater tested during the RPS (2018a) DSI were generally low across the site, with higher concentrations in the immediate vicinity of the source areas. The PFAS source areas identified by RPS are shown in Figure 2, Appendix A.

In addition to the above, GHD identified additional potential source areas through a Stage 1 PSI (GHD, 2020), namely:

- Building 54 Group of USTs; and
- Sewage treatment at the Torpedo Maintenance Facility and Explosive Area E3.

3 Sampling and Analytical Methodology

3.1 Sampling Dates

A summary of the dates for each sampling event of the monitoring period is presented in Table 3-1.

Table 3-1 Summary of Sampling Dates

Sampling event	OMP activity	Sampling period
2021 Q4 - First Quarterly Monitoring Event	Groundwater monitoring (sampling and gauging)	10 – 14 January 2022
	Surface water, porewater and sediment sampling	
2022 Q1 - Second Quarterly Monitoring Event	Groundwater monitoring (sampling and gauging)	14 - 18 March 2022
	Surface water, porewater and sediment sampling	
2022 Q2 - Third Quarterly Monitoring Event	Groundwater monitoring (sampling and gauging)	7 – 9 June 2022
	Surface water, porewater sediment sampling	
2022 Q3 - Fourth Quarterly Monitoring Event	Groundwater monitoring (sampling and gauging)	5 – 7 September 2022
	Surface water, porewater and sediment sampling	

3.2 Changes to the Monitoring Network Condition

During the monitoring period, the following changes to the monitoring network condition were observed:

- Monitoring wells MW137, MW264, MW272 and MW517 were destroyed and MW261 was lost.
- MW010, MW248 and MW518 were found damaged and unable to be sampled.
- MW128, MW258 and MW172 were repaired (unblocked).

Further information regarding changes to the monitoring network and deviations with the SAQP (Cardno 2022, Appendix B) are found in Table 3-2 in Section 3.7.

3.3 Groundwater Sampling

Sampling of selected groundwater monitoring wells was performed in general accordance with the SAQP (Cardno 2022, Appendix B) with the exception of those deviations noted in Section 3.7 of this report, applying methods set out in Section 6.2.3 of the SAQP. The groundwater wells monitored as part of the OMP are shown in Figures 3A-F, Appendix A.

3.4 Porewater Sampling

Sampling of selected porewater monitoring locations was performed in general accordance with the SAQP (Cardno 2022, Appendix B), applying methods set out in Section 6.3.4 of the SAQP. The porewater locations monitored as part of the OMP are shown in Figures 3A-F, Appendix A.

3.5 Surface Water Sampling

Sampling of selected surface water monitoring locations was performed in general accordance with the SAQP (Cardno 2022, Appendix B) applying methods set out in Section 6.3.3 of the SAQP. The surface water locations monitored as part of the OMP are shown in Figures 3A-F, Appendix A.

3.6 Sediment Sampling

Sampling of selected sediment monitoring locations was performed in general accordance with the SAQP (Cardno 2022, Appendix B), applying methods set out in Section 6.3.4 of the SAQP. The sediment locations monitored as part of the OMP are shown in Figures 3A-F, Appendix A.

3.7 Deviations from the OMP SAQP

Deviations from the SAQP (Cardno 2022, Appendix B) for the October 2021 - September 2022 monitoring period are summarised in Table 3-2.

Table 3-2 Summary of Deviations from the OMP SAQP

Location	Deviation	Justification/Discussion
First Quarterly Monitoring Event (January 2022)		
All	Sampling period	Q4 monitoring event was postponed to January 2022 due to the site Christmas shutdown. This is not considered to have impacted the results as sampling and weather conditions were similar to previous Q4 events. Q4 monitoring events have previously been undertaken across the December/January period.
MW109, MW128, MW147, MW158, MW172, MW173, MW197	Not sampled	These wells were found dry during this monitoring event. Limited impact – No data collected for Q4 2021. However most of these wells are seasonally dry and other wells are sampled nearby.
MW258	Not sampled	Monitoring well blocked at 3.69 mBGL. Medium impact (no data collected). Repairs or replacement recommended.
MW137, MW264, MW272	Not sampled	These wells were not found. MW264 is assumed to have been destroyed by recent earthworks within the accommodation area and MW137 and MW272 are assumed to have been destroyed by recent storms which washed away the part of the beach. Medium impact – No data collected. Other wells are sampled nearby. Replacement recommended due to proximity with both a source area and sensitive receptor.
MW117	Well missing	Replaced by MW500. No impact on the assessment of data or conclusions.
Second Quarterly Monitoring Event (March 2022)		
MW128, MW147, MW172, MW197, MW220, MW236, MW248, MW518	Not sampled	These wells were found dry during this monitoring event. Limited impact – No data collected for Q1 2022. However most of these wells are consistently or seasonally dry and other wells are sampled nearby.
MW258	Not sampled	Well blocked at 3.69 mBGL. Medium impact (no data collected). Repairs or replacement recommended.
MW137, MW272	Not sampled	These wells were not found and are assumed to have been destroyed by the winter 2021 storms which washed away part of the beach. Medium impact – No data collected. Other wells are sampled nearby. Replacement recommended due to proximity with both a source area and sensitive receptor.
MW264	Not sampled	MW264 was destroyed by recent earthworks within the accommodation area. Limited impact – No data collected. Other wells are sampled nearby.
SW383	Not Analysed	Sample was not received by the laboratory – assumed misplaced in the field.
Third Quarterly Monitoring Event (June 2022)		
MW147	Not sampled	This well was found dry during this monitoring event. Medium impact – No data collected for Q2 2022, downgradient well MW272 is missing.
MW196	Not sampled	This well was found dry during this monitoring event. No impact on the OMP as data was collected upgradient (MW195S/D), downgradient (MW197) and crossgradient of this well (MW199).

Location	Deviation	Justification/Discussion
MW248	Not sampled	Well casing damaged by earthworks, unable to sample. Medium impact – No data collected, however MW516 was sampled nearby.
MW010	Not sampled	MW010 and MW518 were found damaged, MW261 and MW517 were not found. High impact on the OMP – A number of wells in the Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage Source Area have not been sampled during this monitoring event, therefore no data has been collected in the area for Q2 2022 (data gap).
MW261		
MW517		
MW518		
MW264	Not sampled	MW264 was destroyed by recent earthworks within the accommodation area. Medium impact – No data collected and a number of downgradient wells were also unable to be sampled.
MW137, MW272	Not sampled	These wells were not found and are assumed to have been destroyed by the winter 2021 storms which washed away part of the beach. Medium impact – No data collected. Other wells are sampled upgradient. Replacement recommended due to proximity with both a source area and sensitive receptor.
Multiple (groundwater, porewater and surface water)	TDS and EC not recorded	Water quality meter malfunction. No impact on the OMP, these field parameters are not critical for the interpretation of potential PFAS impacts and risk assessment.
Fourth Quarterly Monitoring Event (September 2022)		
MW147	Not sampled	This well was found blocked at 2.5 mBGL during this monitoring event. Medium impact – No data collected for Q3 2022, downgradient well MW272 was lost (assumed destroyed) and removed from the monitoring program. It was also observed that this well is within dense overgrown bush and therefore repairs appear difficult. Replacement of the lost/compromised wells at the demolition ground is recommended.
MW261	Not Sampled	Well not found (covered in mulch in new vegetated patch). Medium impact – Several wells have been lost in this area (and subsequently removed from the SAQP)
MW496	Sampled	Sampled in replacement of nearby damaged well MW248. Replacement location deemed suitable as at proximity (<50m) to the damaged well, and similar screen depth (3.5 – 8.0 mBGL). Positive impact on the OMP – collection of additional PFAS data.
All groundwater monitoring locations	Water quality meter not placed down-hole	The water quality parameters were taken from water collected from the HydraSleeve® rather than placing the water quality meter inside the wells casing to prevent cross-contamination from happening. No impact on the OMP.

4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP (Cardno 2022, Appendix B):

- Quality assurance (QA) documentation.
- Bias.
- Data Representativeness.
- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability; and
- Data Set Completeness.

The laboratories have undertaken different quality control (QC) measures in all sets of sample analysis which validate the accuracy of their techniques. The laboratories are appropriately certified (NATA) for environmental sample analysis. It is considered that the analytical results are accurate and reliable for the purposes of this assessment.

Field QC protocols were adopted to ensure all samples were collected in accordance with applicable industry standards and guidance, and the methodologies described in the SAQP (Cardno 2022, Appendix B). The field staff involved in sampling were experienced in performing these duties and complied with the procedures detailed in the SAQP. Collection of QA/QC samples and calibration of field equipment as well as decontamination practices ensured the samples and field data were collected in a consistent and reliable method.

The data validation process (refer to the Factual Reports in Appendix C) has concluded that there are no significant systematic errors in the data collection process. Therefore, the data set used as the basis for this assessment is considered valid and complete.

5 Assessment Criteria

5.1 Groundwater, surface water and porewater

The assessment levels adopted for groundwater and surface water in the OMP are based upon the Heads of Environmental Protection Authorities (HEPA) Australia and New Zealand (2020) *PFAS National Environmental Management Plan (NEMP) 2.0*. These criteria were adopted in relation to the exposure pathways and potential receptors identified in the conceptual site model (CSM) during the investigation stage (DSI and ERA).

The adopted assessment criteria for groundwater, surface water and porewater are detailed in Table 5-1.

Table 5-1 Criteria for Groundwater, Surface water and Porewater

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Incidental ingestion Human Health – Drinking Water Quality Guideline	0.07[1]	0.56	NHMRC 2019, HEPA 2020
Recreational Use Human Health – Recreational Water	2[1]	10	NHMRC 2019, HEPA 2020
Ingestion/uptake Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

1. Sum of PFOS and PFHxS.
2. PFOS only; Practical screening guideline of 0.01 µg/L is based on typical current laboratory limit of reporting. Therefore, it should be noted that warning and action levels would not be relevant until the detection limits are reduced or the screening levels are increased (HEPA 2020).

PFOS – Per-fluoro-octane sulfonate.
PFHxS – Per-fluoro-hexane sulfonate.
PFOA – Per-fluoro octanoic Acid.

5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment results will be compared to the historical data range for each location monitored.

6 Contextual and Ancillary Information

6.1 Additional Analytical Data

All data available on the ESdat database at the time of reporting for each OMP monitoring location was utilised to form the basis of the interpretations and conclusions presented in this report. This data encompasses all historical data from the groundwater, surface water, porewater and sediment sampling locations. Each sampling location has been monitored for a different timeframe with some locations containing historical results from as far back as 2010. This historical data can be found in Table 1-4 of Appendix D. No additional PFAS data outside of the results obtained from the OMP was provided for the monitoring period.

In addition to the groundwater wells monitored quarterly as part of the OMP, PFAS testing on groundwater was undertaken in a number of potential PFAS source areas as part of the Stage 1 PSI (GHD, 2019) and Stage 2 DSI (GHD, 2020).

6.2 Remediation and Infrastructure Projects

No remediation projects or infrastructure works that could affect the interpretation of monitoring results were undertaken at the site during the monitoring period. Construction upgrade works were observed within the Accommodation Area which resulted in the loss of a few monitoring wells (refer to Section 3.2).

6.3 Climate

Rainfall is potentially the most significant meteorological factor that can influence PFAS migration through groundwater recharge and subsequent flow. Monthly rainfall for all months between January 2018 and December 2022 [measured at Bureau of Meteorology (BoM) station 009256, Garden Island HSF] are displayed in Figure 6-1.

Significantly more rainfall was reported in February, May, July and September 2021 than in preceding years with rainfall over the monitoring period relatively consistent.

Monthly maximum mean temperatures recorded between 2018 and 2022 are mostly consistent with the monthly mean maximum data (2001-2022), with no noticeable variation recorded during the monitoring period (Figure 6-2).

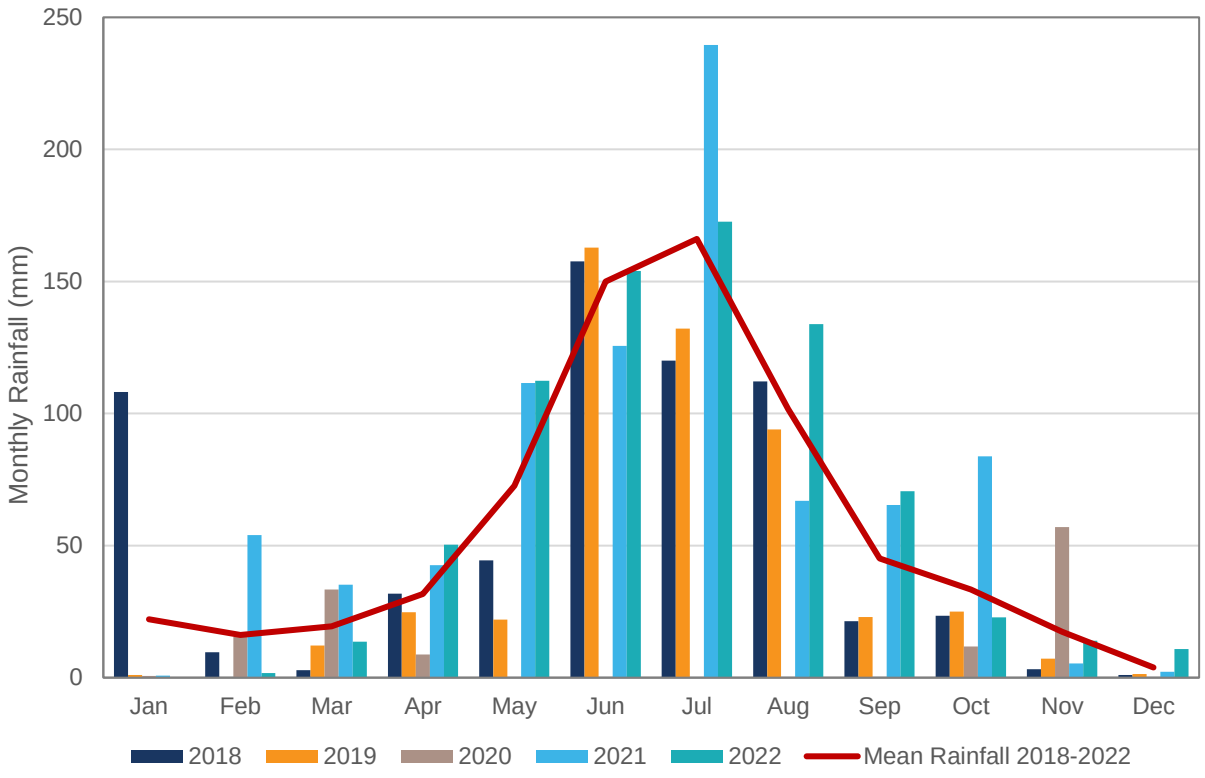


Figure 6-1 Monthly rainfall and long term mean monthly rainfall for Garden Island HSF (station 009256) (BoM, 2023)

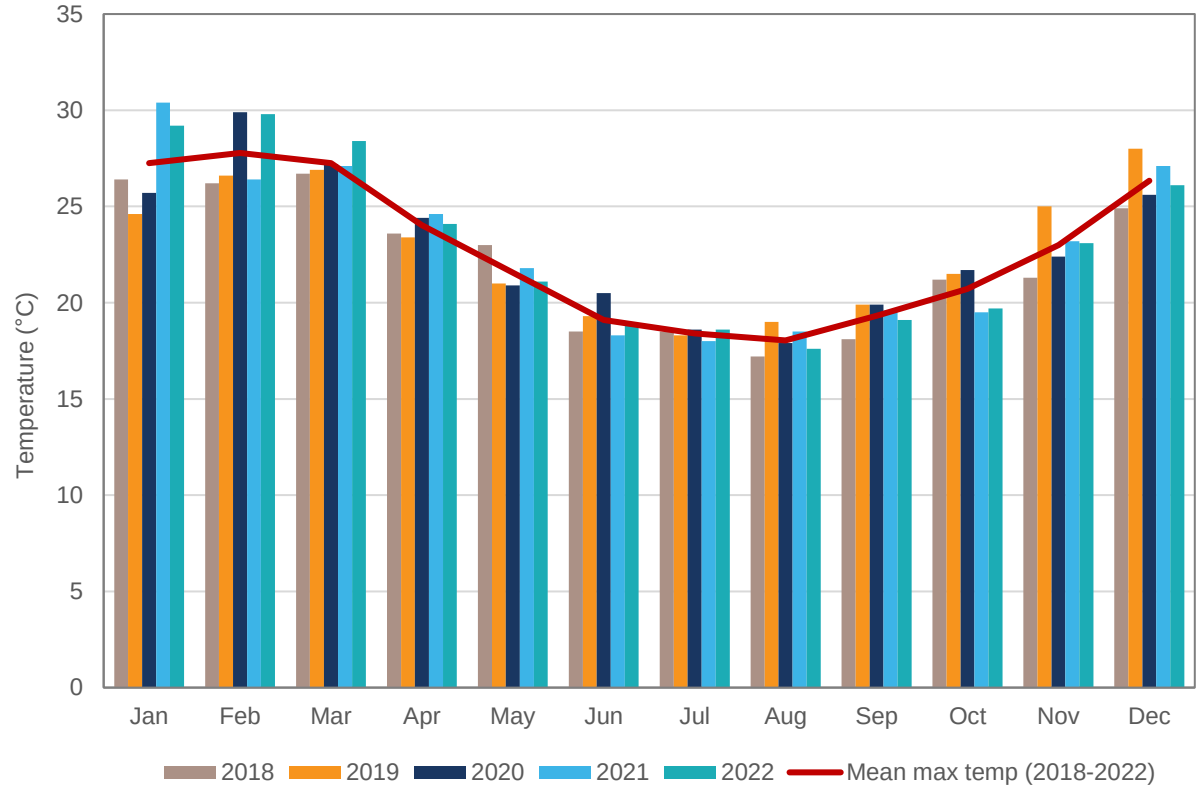


Figure 6-2 Monthly mean max temperature and long term mean monthly max temperature Garden Island HSF (station 009256) (BoM, 2023)

7 Monitoring Data Summary

The quarterly monitoring results are presented within Cardno's Factual Reports provided in Appendix C. A summary is presented in the following sections.

Physicochemical parameters recorded at each monitoring location during the quarterly monitoring events are provided within the field records tables (Tables 6-9) in Appendix D. Summary tables of laboratory analytical results are provided in Tables 1-4, Appendix D.

Sum of PFOS and PFHxS concentration maps for groundwater, surface water and porewater are presented in Appendix A:

- Figures 8A-C for the January 2022 quarterly event.
- Figures 9A-C for the March 2022 quarterly event.
- Figures 10A-C for the June 2022 quarterly event; and
- Figures 11A-C for the September 2022 quarterly event.

PFOA concentration maps for groundwater, surface water and porewater are presented in Appendix A:

- Figures 12A-C for the January 2022 quarterly event.
- Figures 13A-C for the March 2022 quarterly event.
- Figures 14A-C for the June 2022 quarterly event; and
- Figures 15A-C for the September 2022 quarterly event.

Sum of PFOS and PFHxS concentration maps for sediment are presented in Appendix A:

- Figures 16A-C for the January 2022 quarterly event.
- Figures 17A-C for the March 2022 quarterly event.
- Figures 18A-C for the June 2022 quarterly event; and
- Figures 19A-C for the September 2022 quarterly event.

7.1 Groundwater

7.1.2 Groundwater Geochemical Parameters

Groundwater geochemical parameters recorded during the quarterly monitoring events are summarised in Table 7-1 and provided within Table 5, Appendix D.

Table 7-1 Groundwater Geochemical Parameters

Parameter	January 2022	March 2022	June 2022	September 2022
DO	0.31 mg/L (MW228) – 5.16 mg/L (MW121) *Anaerobic to Aerobic conditions*	0.27 mg/L (MW126) – 7.03 mg/L (MW224) *Anaerobic to Aerobic conditions*	0.25 mg/L (MW227) – 8.84 mg/L (MW166) *Anaerobic to Aerobic conditions*	0.21 mg/L (MW125) – 7.69 mg/L (MW173) *Anaerobic to Aerobic conditions*
EC	332.6 µS/cm (MW500) – 43,258 µS/cm (MW126)	342.1 µS/cm (MW233) – 52,750 µS/cm (MW149)	242.6 µS/cm (MW233) – 73,403 µS/cm (MW228)	357 µS/cm (MW257) – 44,742 µS/cm (MW149)
TDS	215.15 mg/L (MW500) – 28,119 mg/L (MW126) *Fresh to highly saline water*	252.1 mg/L (MW233) – 34,320 mg/L (MW149) *Fresh to highly saline water*	157.95 mg/L (MW233)– 54,925 mg/L (MW228) *Fresh to highly saline water*	232.05 mg/L (MW257)– 30,279 mg/L (MW125) *Fresh to highly saline water*
pH	6.95 (MW126) – 8.51 (MW233) *Near neutral to alkaline conditions*	6.56 (MW214) – 8.50 (MW233) *Near neutral to alkaline conditions*	6.94 (MW127) – 8.08 (MW257) *Near neutral to alkaline conditions.*	6.27 (MW288) – 8.66 (MW233) *Near neutral to alkaline conditions*
ORP	-303.8 mV (MW124) – 171.7 mV (MW123) *Reducing to oxidising groundwater conditions.*	-320.3 mV (MW126) – 147.6 mV (MW121) *Reducing to oxidising groundwater conditions.*	-286.6 mV (MW193) – 123.1 mV (MW500) *Reducing to oxidising groundwater conditions.*	-347.7 mV (MW125) – 152.1 mV (MW228) *Reducing to oxidising groundwater conditions.*

No seasonal trend was observed in the groundwater geochemical parameters. Groundwater salinity increases with proximity to the coastline.

7.1.3 Groundwater Elevations and Migration Contours

Groundwater levels and flow directions recorded during the quarterly monitoring events are summarised in Table 7-2 and gauging data is provided within Table 9, Appendix D. The inferred groundwater contours for each monitoring event are presented in Figures 4 to 7, Appendix A.

Table 7-2 Groundwater Levels and Flow Direction

Item	January 2022	March 2022	June 2022	Sep 2022
Depths to groundwater	1.72 mbTOC (MW226) – 28.64 mbTOC (MW171)	0.895 mbTOC (MW226) – 28.451 mbTOC (MW171)	1.51 mbTOC (MW227) – 28.341 mbTOC (MW171)	1.40 mbTOC (MW202) – 28.538 (MW171)
Groundwater elevation	-0.065 mAHD (MW214) - 1.069 mAHD (MW120)	0.061 mAHD (MW127) – 0.854 mAHD (MW226)	-0.083 mAHD (MW217) – 1.229 mAHD (MW199)	0.217 (MW195D) – 1.122 (MW224)
Inferred direction of groundwater flow	Groundwater was interpreted to be radial from Garden Island where mounding is occurring with rainfall infiltration. Groundwater flows toward Cockburn Sound of the East and towards the Indian Ocean on the West of the island			
Seasonal difference in groundwater elevation	Groundwater levels were generally consistent between monitoring events, with average SWL readings of 0.31 mAHD (January), 0.39 mAHD (March), 0.44 mAHD (June) and 0.52 mAHD (September).			

Groundwater elevations and flow direction for the monitoring period were consistent with historical data. Groundwater levels in wells close to the shoreline are expected to be influenced by tidal effects.

7.1.4 Groundwater Results Summary

A number of monitoring locations are targeting the source areas and downgradient areas as shown in Figures 3A to 3F, Appendix A.

7.1.4.2 Fire Training Area

A summary of the PFOA and Sum of PFOS and PFHxS[2] concentrations for the monitoring period and the historical concentration ranges for the FTA monitoring locations is presented in Table 7-3 and plotted in Figure 7-2.

- No new exceedances of the assessment criteria were identified during the monitoring period.
- No first-time detections of PFOS, PFOA and PFOS+PFHxS were identified during the monitoring period.
- Consistent with previous monitoring periods, PFOS+PFHxS concentrations continued to exceed the Recreational criteria of 2 µg/L at all monitoring wells, noting that new minimums were identified at MW109, MW121 and MW500.

Table 7-3 FTA PFOS+PFHxS and PFOA concentrations (µg/L)

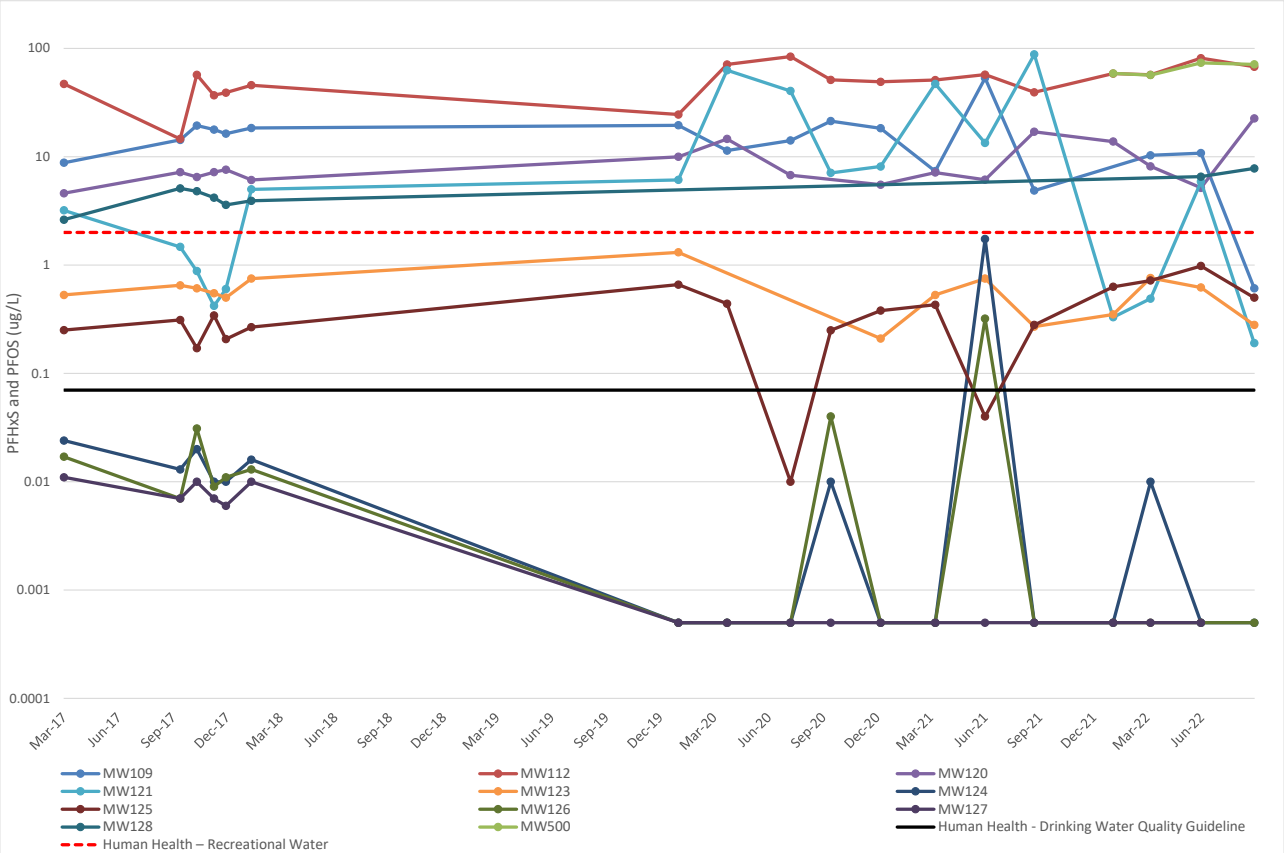
Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min - Max	Jan-22	Mar-22	Jun-22	Sep-22
MW109	PFOS+PFHxS	4.87 – 53.2	NS	10.3	10.8	0.61
	PFOA	0.16 – 0.94	NS	0.38	0.29	0.01
MW112	PFOS+PFHxS	14.6 – 83.9	58.5	57.0	81.2	67.6
	PFOA	0.56 - 7.3	0.58	1.67	0.99	1.4
MW120	PFOS+PFHxS	4.6 – 17.0	13.8	8.15	5.16	22.6
	PFOA	0.12 – 1.59	2.19	1.59	0.42	2.00
MW121	PFOS+PFHxS	0.42 – 87.9	0.33	0.49	5.89	0.19
	PFOA	0.029 – 1.42	0.02	0.04	0.20	0.02
MW123	PFOS+PFHxS	0.21 – 1.31	0.35	0.76	0.62	0.28
	PFOA	0.005 - 0.02	<0.01	<0.01	<0.01	<0.01
MW124	PFOS+PFHxS	<0.01 – 1.74	<0.01	0.01	<0.01	<0.01
	PFOA	<0.01 - 0.05	<0.01	<0.01	<0.01	<0.01
MW125	PFOS+PFHxS	0.01 - 0.66	0.63	0.72	0.98	0.50
	PFOA	<0.001 - 0.002	<0.01	<0.01	<0.01	<0.01
MW126	PFOS+PFHxS	0.007 - 0.32	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW127	PFOS+PFHxS	0.006 - 0.011	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.001	<0.01	<0.01	<0.01	<0.01
MW128	PFOS+PFHxS	2.62 - 5.10	NS	NS	6.54	7.79
	PFOA	0.029 - 0.14	NS	NS	0.06	0.09
MW500	PFOS+PFHxS	NS	13.6	45.1	1.76	58.7
	PFOA	NS	1.76	1.40	1.83	1.22

New Maximum **New Minimum** **New Exceedance**

Note: NS- Not Sampled

[2] It is noted that PFHxS concentrations were not analysed prior to 2017 and the Sum of PFOS and PFHxS was not reported by the laboratory before 2019. The Sum of PFOS and PFHxS was calculated from PFOS and PFHxS concentrations for the 2017-2018 data.

Figure 7-2 FTA Sum of PFOS+PFHxS concentration trends (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.4.3 Demolition Ground

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the Demolition Ground monitoring locations is presented in Table 7-4 and plotted in Figure 7-3.

- No new exceedances of the assessment criteria were identified over the monitoring period for PFOS, PFOA, and PFOS+PFHxS.
- PFOA concentrations were reported below the LOR at monitoring wells MW139 and MW149. Concentrations at MW141 continued to exceed the drinking water criteria of 0.56 µg/L but below the recreational criteria.
- New maximum concentrations of PFOS+PFHxS were identified at MW141 and MW149 during the January 2022 monitoring event. The concentrations of 201 µg/L (MW141) and 0.06 µg/L (MW149) decreased to below the assessment criteria and LOR, respectively, in the following monitoring events.
- No first-time detections of PFOA or PFOS+PFHxS were recorded at the Demolition Ground during the monitoring period.

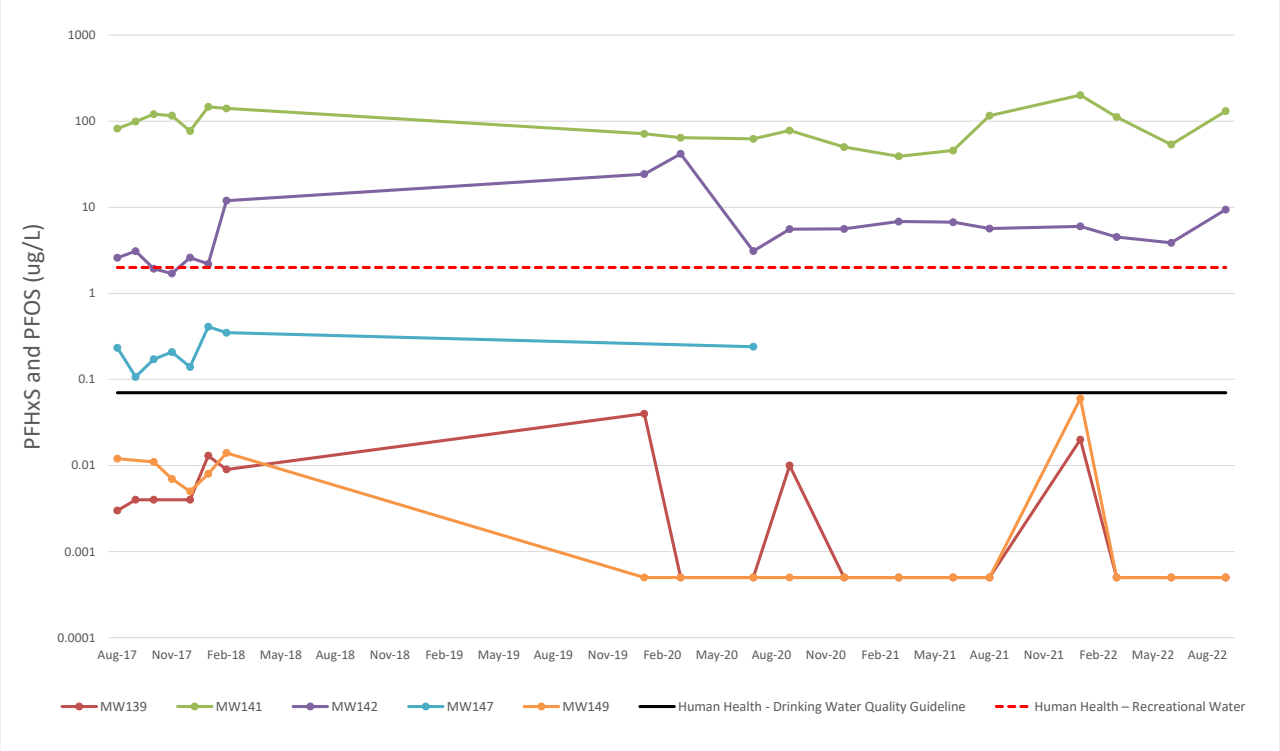
Table 7-4 Demolition ground PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	2022 OMP Monitoring			
		Min - Max	Jan-22	Mar-22	Jun-22	Sep-22
MW139	PFOS+PFHxS	<0.001 – 0.04	0.02	<0.01	<0.01	<0.01
	PFOA	<0.01 – 0.16	<0.01	<0.01	<0.01	<0.01
MW141	PFOS+PFHxS	39.1 – 147	201.0	112.0	53.6	131.0
	PFOA	0.66 – 6.2	3.97	3.17	1.34	2.86
MW142	PFOS+PFHxS	1.7 – 41.8	6.00	4.52	3.87	9.41
	PFOA	0.02 – 3.04	0.14	0.18	0.11	0.41
MW147	PFOS+PFHxS	0.107 – 0.349	NS	NS	NS	NS
	PFOA	<0.001 - 0.13	NS	NS	NS	NS
MW149	PFOS+PFHxS	<0.01 – 0.014	0.06	<0.01	<0.01	<0.01
	PFOA	<0.001 - 0.001	<0.01	<0.01	<0.01	<0.01

New Maximum | **New Minimum** | **New Exceedance**

Notes:
NS **-** Not Sampled

Figure 7-3 Demolition ground PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.4.4 Wastewater Treatment Plant

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the WWTP monitoring locations is presented in Table 7-5 and plotted in Figure 7-4.

- New minimum concentrations were identified at MW161 during the March and September 2022 monitoring events for PFOS+PFHxS. However, concentrations continued to exceed the assessment criteria.
- New exceedances of the assessment criteria were identified at MW172 during the June 2022 monitoring event:

- PFOS exceeded the marine (99%) criteria of 0.00023 µg/L and continued to do so in the September 2022 monitoring event.
- PFOA exceeded the drinking water criteria (0.56 µg/L) during the June and September 2022 monitoring events.
- PFOS+PFHxS exceeded the drinking water criteria (0.07 µg/L) during the June and September 2022 monitoring events.

Table 7-5 WWTP PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical Range	October 2021 - September 2022 Monitoring Period			
		Min - Max	Jan-22	Mar-22	Jun-22	Sep-22
MW158	PFOS+PFHxS	<0.01 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW161	PFOS+PFHxS	5.59 – 16.8	6.34	4.43	5.05	3.25
	PFOA	0.03 – 0.23	0.10	0.06	0.09	0.02
MW166	PFOS+PFHxS	2.11 – 16	8.03	7.81	8.67	6.70
	PFOA	0.04 – 0.16	0.09	0.12	0.10	0.06
MW171	PFOS+PFHxS	0.02 – 5.28	0.18	0.03	0.27	0.08
	PFOA	<0.01 – 0.26	<0.01	<0.01	<0.01	<0.01
MW172	PFOS+PFHxS	NA	NS	NS	13.2	29.6
	PFOA	<0.001*	NS	NS	0.66	0.59
MW173	PFOS+PFHxS	0.035 – 13.0	NS	9.63	13.2	9.20
	PFOA	0.008 – 1.1	NS	0.45	0.54	0.35
MW193	PFOS+PFHxS	6.8 – 21.7	6.60	13.8	9.90	12.9
	PFOA	0.3 – 0.81	0.34	0.74	0.60	0.52
MW195D	PFOS+PFHxS	<0.01 - 0.021	<0.01	0.02	0.03	0.01
	PFOA	<0.01 - 0.006	<0.01	<0.01	<0.01	<0.01
MW195S	PFOS+PFHxS	0.002 – 0.048	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 – 0.01	<0.01	<0.01	<0.01	<0.01
MW196	PFOS+PFHxS	<0.01	<0.01	<0.01	NS	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	NS	<0.01
MW197	PFOS+PFHxS	<0.001 – 0.044	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 – 0.004	<0.01	<0.01	<0.01	<0.01
MW199	PFOS+PFHxS	<0.001 – 0.047	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 – 0.002	<0.01	<0.01	<0.01	<0.01
MW200	PFOS+PFHxS	<0.001 - 0.07	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 – 0.001	<0.01	<0.01	<0.01	<0.01
MW202	PFOS+PFHxS	0.06 – 0.19	0.08	0.07	0.08	0.07
	PFOA	<0.001 – 0.002	<0.01	<0.01	<0.01	<0.01
MW203	PFOS+PFHxS	<0.01 - 0.11	0.07	0.05	0.04	0.05
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01

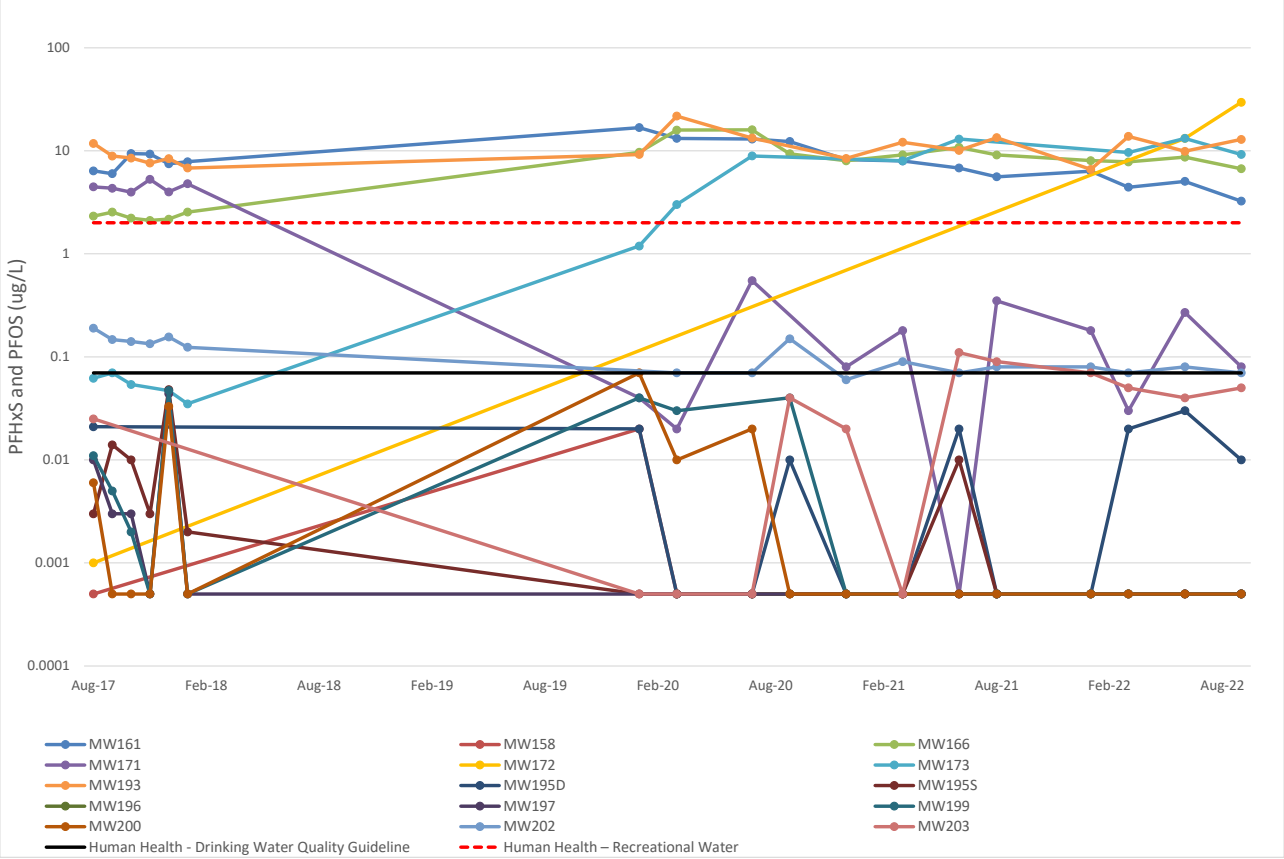
New Maximum **New Minimum** **New Exceedance**

Notes:

* Only sampled once before

NA – Not Analysed NS – Not Sampled

Figure 7-4 WWTP PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.4.5 *Helicopter Support Facility*

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the HSF monitoring locations is presented in Table 7-6 and plotted in Figure 7-5.

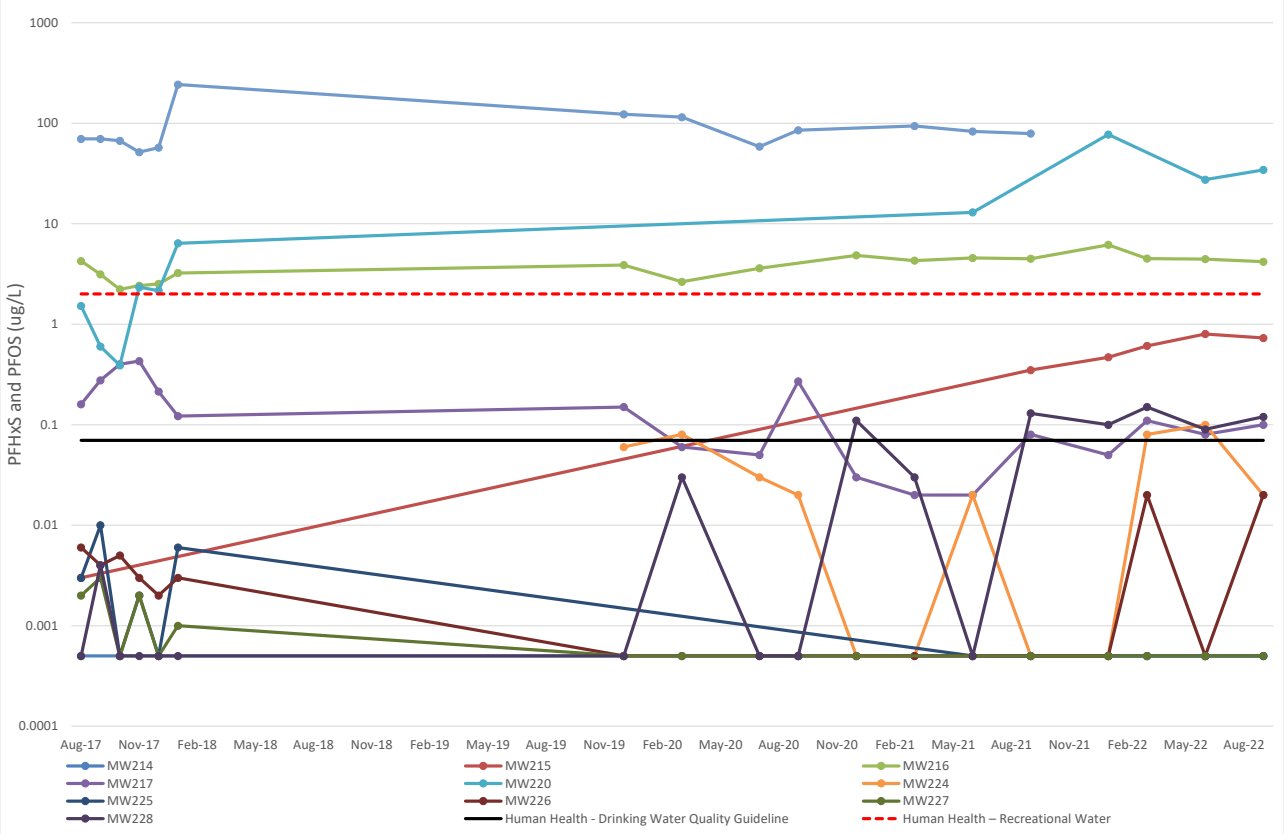
- The highest concentrations were recorded at MW282 (source area) whilst concentrations in MW226 and MW227 (shoreline to the northeast) were constantly below the LOR.
- Exceedances of the recreational water guideline for PFOS+PFHx (2 µg/L) use criteria were reported during all monitoring events for MW216 (source area) and MW282 (source area).
- New minimum concentrations were identified across the monitoring network, including monitoring wells located adjacent the shoreline. These included MW215, MW228, MW220 where concentrations of PFOS+PFHxS and PFOA were comparatively lower than the previous monitoring period.
- No first-time detections of PFOS or PFOS+PFHxS, or new exceedances of the assessment criteria were identified at the HSF during the monitoring period.

Table 7-6 HSF PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min - Max	Jan-22	Mar-22	Jun-22	Sep-22
MW214	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW215	PFOS+PFHxS	0.003 – 0.35	0.47	0.61	0.80	0.73
	PFOA	<0.001 - <0.01	<0.01	0.01	<0.01	<0.01
MW216	PFOS+PFHxS	2.228 – 4.85	6.18	4.51	4.45	4.19
	PFOA	0.072 - 0.39	0.34	0.41	0.30	0.22
MW217	PFOS+PFHxS	0.02 – 0.43	0.05	0.11	0.08	0.10
	PFOA	0.20 – 0.38	0.30	0.43	0.38	0.37
MW220	PFOS+PFHxS	0.39 – 13.0	77.4	NS	27.5	34.4
	PFOA	0.014 – 0.60	0.64	NS	0.51	0.45
MW224	PFOS+PFHxS	0.02 – 0.08	<0.01	0.08	0.10	0.02
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW225	PFOS+PFHxS	<0.001 – 0.006	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW226	PFOS+PFHxS	<0.01 – 0.006	<0.01	0.02	<0.01	0.02
	PFOA	<0.001 – 0.001	<0.01	<0.01	<0.01	<0.01
MW227	PFOS+PFHxS	<0.001 – 0.003	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.001	<0.01	<0.01	<0.01	<0.01
MW228	PFOS+PFHxS	<0.001 – 0.13	0.10	0.15	0.09	0.12
	PFOA	<0.001 – 0.03	0.03	0.05	0.02	0.10
MW282	PFOS+PFHxS	58.6 – 243.0	4.62	3.23	3.03	4.65
	PFOA	4.5 – 13	<0.01	<0.01	<0.01	<0.01

New Maximum | New Minimum | New Exceedance

Figure 7-5 HSF PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.4.6 AVCAT storage, fuel farm and infiltration swale

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the AVCAT storage, fuel farm and infiltration swale monitoring locations is presented in Table 7-7 and plotted in Figure 7-6.

- No new exceedances or first-time detections were reported for PFOS+PFHxS, PFOA or PFOS.
- New maximum concentrations of PFOS+PFHxS and PFOA were reported at MW236 (fuel farm source area) in the January, June, and September 2022 monitoring events.
- Concentrations of PFOS+PFHxS at MW233 (infiltration swale) represented new minimums during the June and September 2022 monitoring events.
- PFOS+PFHxS concentrations at MW496 exceeded the recreational criteria of 2 µg/L at during the September 2022 monitoring event, noting that the monitoring well was not sampled earlier in the year.

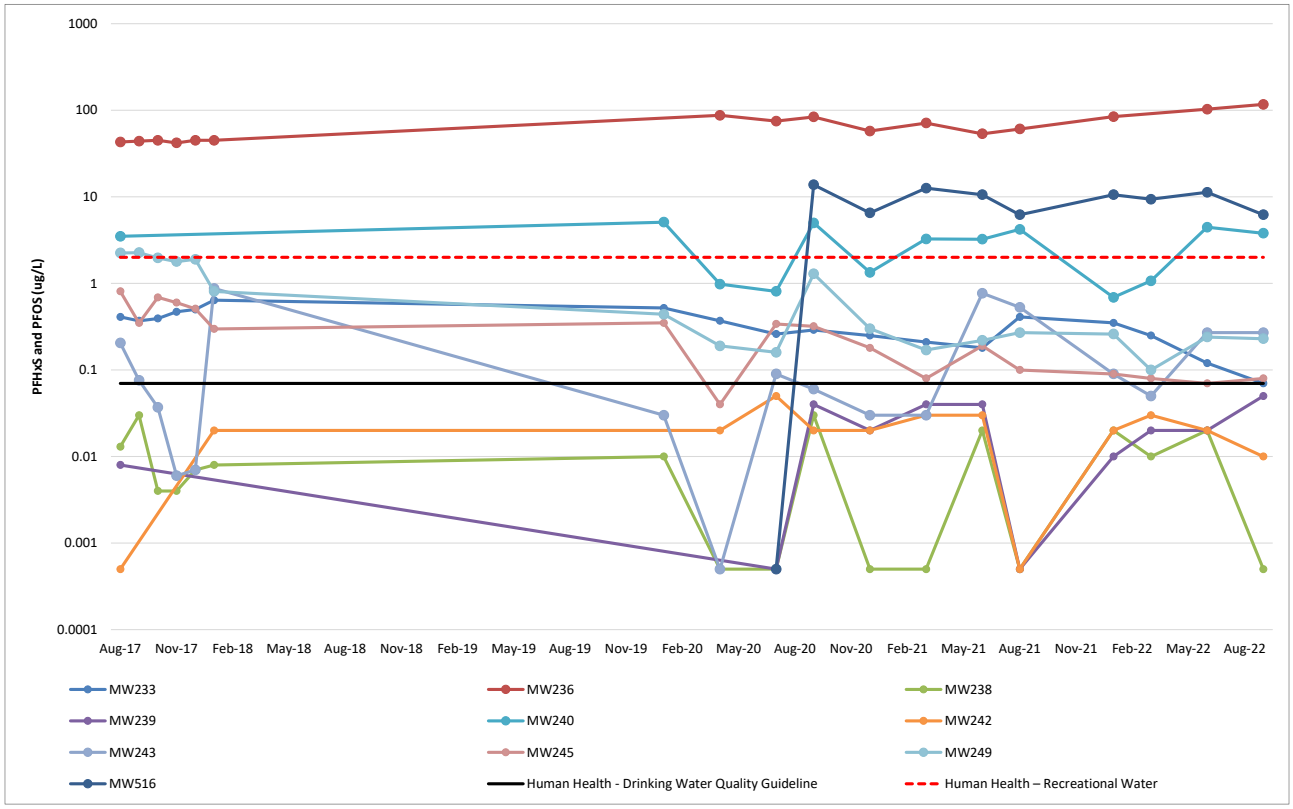
Table 7-7 AVCAT storage, fuel farm and infiltration swale PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 - September 2022 Monitoring Period			
		Min - Max	Jan-22	Mar-22	Jun-22	Sep-22
Infiltration Swale						
MW233	PFOS+PFHxS	0.18 – 0.64	0.35	0.25	0.12	0.07
	PFOA	0.005 – 0.04	<0.01	<0.01	<0.01	<0.01
Fuel Farm						
MW236	PFOS+PFHxS	42 – 87.5	84.5	NS	103.0	117.0
	PFOA	0.99 – 1.74	2.41	NS	1.68	1.70
AVCAT Storage						
MW238	PFOS+PFHxS	0.004 – 0.03	0.02	0.01	0.02	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW239	PFOS+PFHxS	<0.001 – 0.04	0.01	0.02	0.02	0.05
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
MW240	PFOS+PFHxS	0.81 – 5.1	0.69	1.07	4.46	3.80
	PFOA	0.04 – 0.30	<0.01	0.01	0.09	0.11
MW242	PFOS+PFHxS	<0.001 – 0.05	0.02	0.03	0.02	0.01
	PFOA	<0.001 – <0.01	<0.01	<0.01	<0.01	<0.01
MW243	PFOS+PFHxS	0.006 – 0.874	0.09	0.05	0.27	0.27
	PFOA	<0.001 – 0.018	<0.01	<0.01	<0.01	<0.01
MW245	PFOS+PFHxS	0.298 – 0.81	0.09	0.08	0.07	0.08
	PFOA	<0.01 – 0.022	<0.01	<0.01	<0.01	<0.01
MW516	PFOS+PFHxS	<0.01 – 14.5	10.6	9.38	11.3	6.21
	PFOA	<0.01 – 0.20	0.08	0.07	0.08	0.16
MW249	PFOS+PFHxS	0.16 – 2.27	0.26	0.10	0.24	0.23
	PFOA	<0.01 – 0.083	<0.01	<0.01	<0.01	0.01
MW496	PFOS+PFHxS	NA	NS	NS	NS	8.80
	PFOA	NA				0.16

New Maximum **New Minimum** **New Exceedance**

Note: NS **-** Not sampled
NA – Not Analysed

Figure 7-6 AVCAT storage, fuel farm and infiltration swale PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

7.1.4.7 Fire Station, Dredge Spoil, Ship Sullage Area

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the fire station monitoring locations is presented in Table 7-8 and plotted in Figure 7-7 and Figure 7-8.

- No new exceedances or first-time detections were reported for PFOS+PFHxS, PFOS, or PFOA.
- New minimum concentrations of PFOS+PFHxS were identified at MW255 and MW261 during the January and March 2022 monitoring events, and MW258 and MW259 during the June 2022 monitoring event. However, concentrations at MW258 increased to a new maximum of 24.8 µg/L during the September 2022 monitoring event.

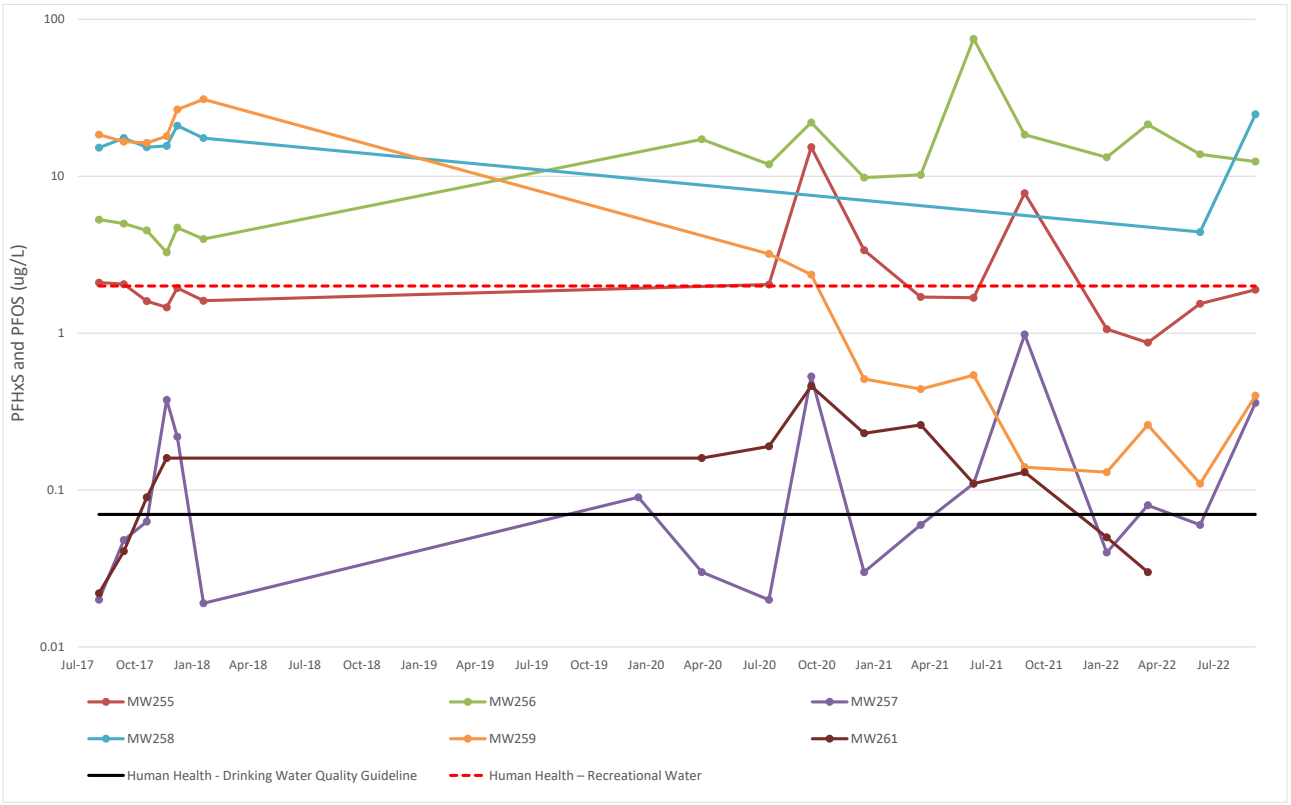
Table 7-8 Fire station, dredge soil and ship sullage area PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min - Max	Jan-22	Mar-22	Jun-22	Sep-22
Fire Station						
MW255	PFOS+PFHxS	1.46 – 15.3	1.06	0.87	1.54	1.89
	PFOA	0.01 – 0.06	0.01	0.01	<0.05	0.03
MW256	PFOS+PFHxS	3.98 – 75.0	13.2	21.4	13.8	12.4
	PFOA	0.093 – 2.34	0.39	0.72	0.42	0.16
Flammable / hazardous goods and waste storage area						
MW257	PFOS+PFHxS	0.019 – 0.98	0.04	0.08	0.06	0.36
	PFOA	<0.001 – 0.12	<0.01	<0.01	<0.01	0.02
MW258	PFOS+PFHxS	15.2 – 21	NS	NS	4.41	24.8
	PFOA	0.42 – 0.53	NS	NS	0.06	0.58
MW259	PFOS+PFHxS	0.14 – 30.9	0.13	0.26	0.11	0.40
	PFOA	<0.01 – 0.56	<0.01	<0.01	<0.01	<0.01
Ship sullage area						
MW261	PFOS+PFHxS	<0.001 – 0.46	0.05	0.03	NS	NS
	PFOA	<0.001 – <0.01	<0.01	<0.01	NS	NS
Dredge spoil						
MW268	PFOS+PFHxS	0.20 – 0.80	0.41	0.35	0.41	0.58
	PFOA	<0.01 – 0.003	<0.01	<0.01	<0.01	<0.01
MW269	PFOS+PFHxS	0.262 – 1.56	0.46	1.08	1.04	1.14
	PFOA	0.002 – 0.01	<0.01	0.01	0.01	0.02

New Maximum **New Minimum** **New Exceedance**

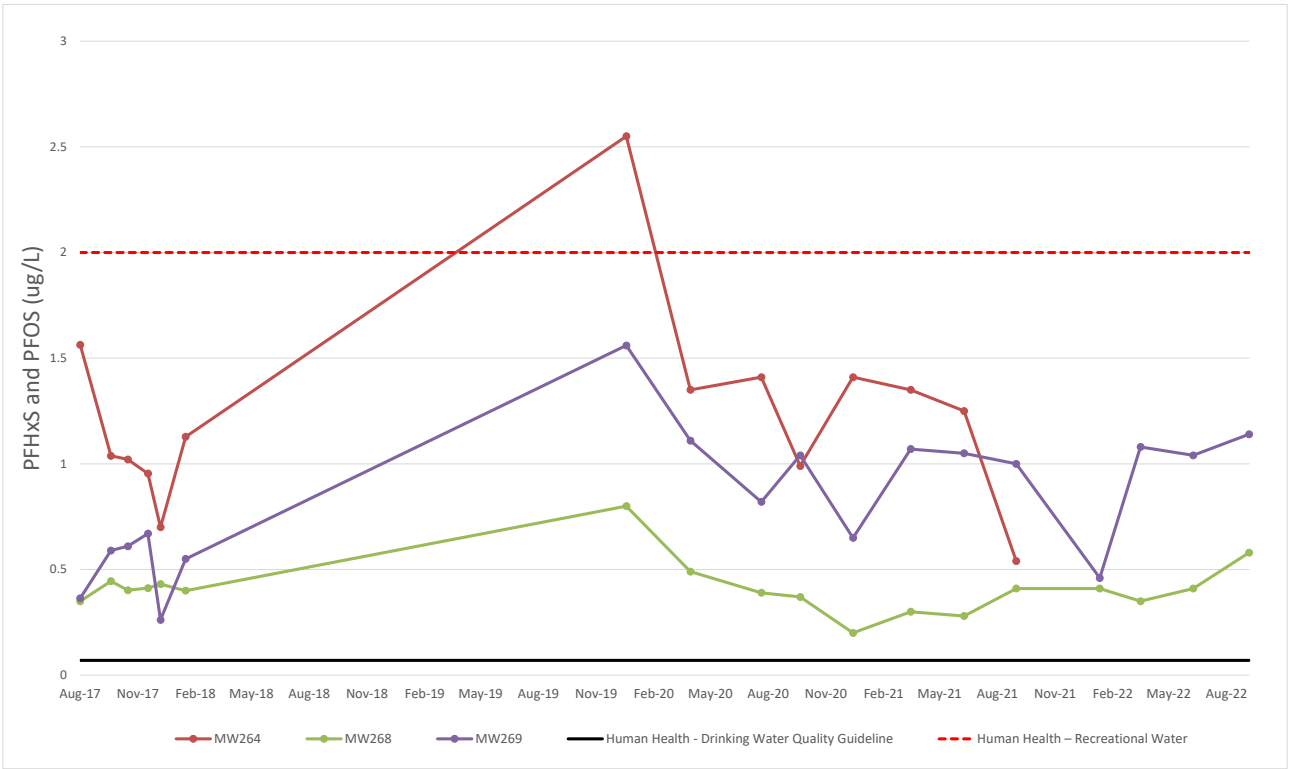
Note: NS- Not sampled

Figure 7-7 Fire station and ship sullage area PFOS+PFHxS concentrations (µg/L)



Note: A logarithmic scale was used for the vertical axis

Figure 7-8 Dredge spoil PFOS+PFHxS concentrations (µg/L)



7.1.4.8 Accommodation Area

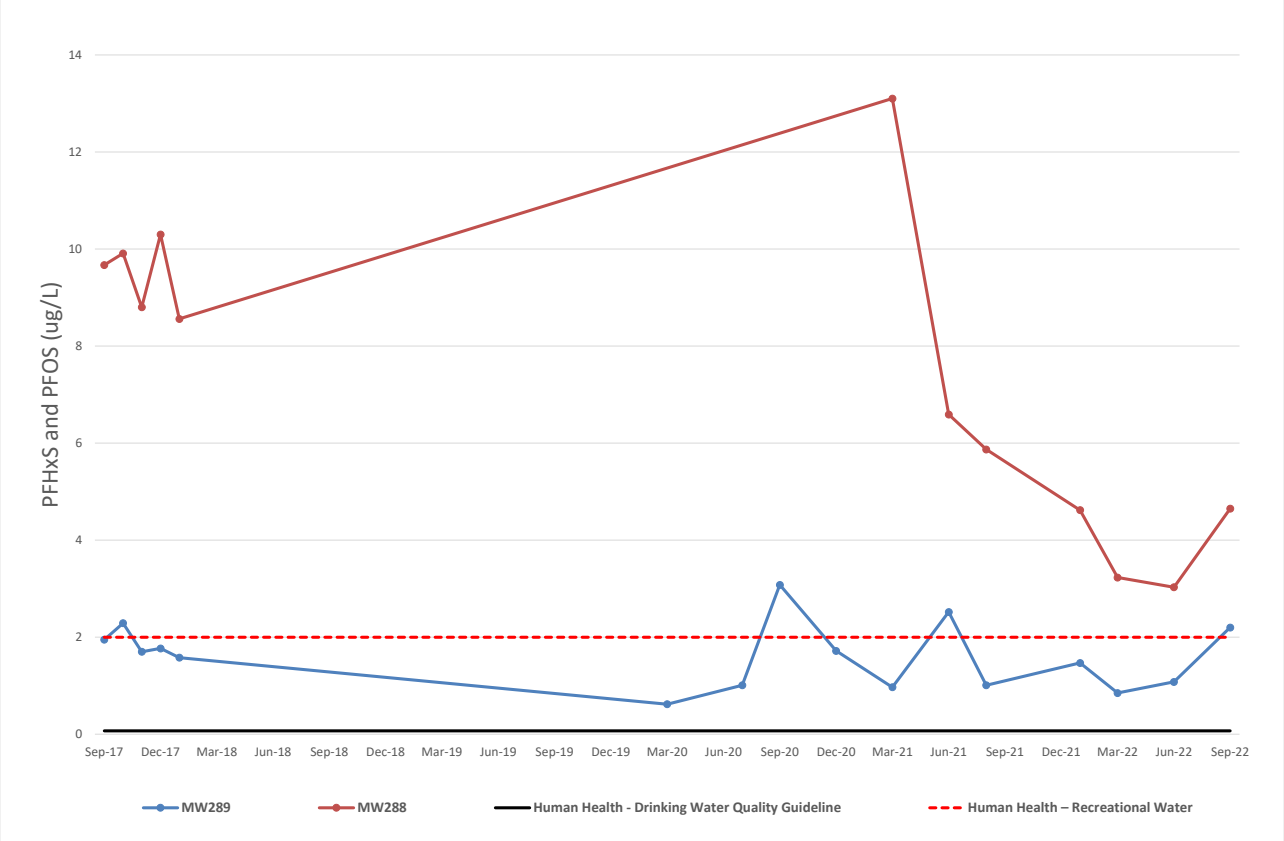
A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the accommodation area monitoring locations is presented in Table 7-9 and plotted in Figure 7-9.

- No new exceedances or first-time detections were reported for PFOS+PFHxS, PFOS, or PFOA.
- A new concentration maximum for PFOA was recorded marginally above historical range at MW289 in January 2022.
- New minimum concentrations of PFOS+PFHxS (January, March, June) and PFOA (January) were identified, where MW288 concentrations continued to exceed the drinking water (0.07 µg/L) and recreational criteria (2 µg/L).

Table 7-9 Accommodation area PFHxS+PFOS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min - Max	Jan-22	Mar-22	Jun-22	Sep-22
MW288	PFOS+PFHxS	5.87 – 13.1	4.62	3.23	3.03	4.65
	PFOA	0.03 – 0.12	<0.01	<0.01	<0.01	<0.01
MW289	PFOS+PFHxS	0.62 – 3.08	1.47	0.85	1.08	2.20
	PFOA	0.006 – 0.04	0.05	0.05	0.05	0.04
New Maximum		New Minimum		New Exceedance		

Figure 7-9 Accommodation area PFOS+PFHxS concentrations (µg/L)



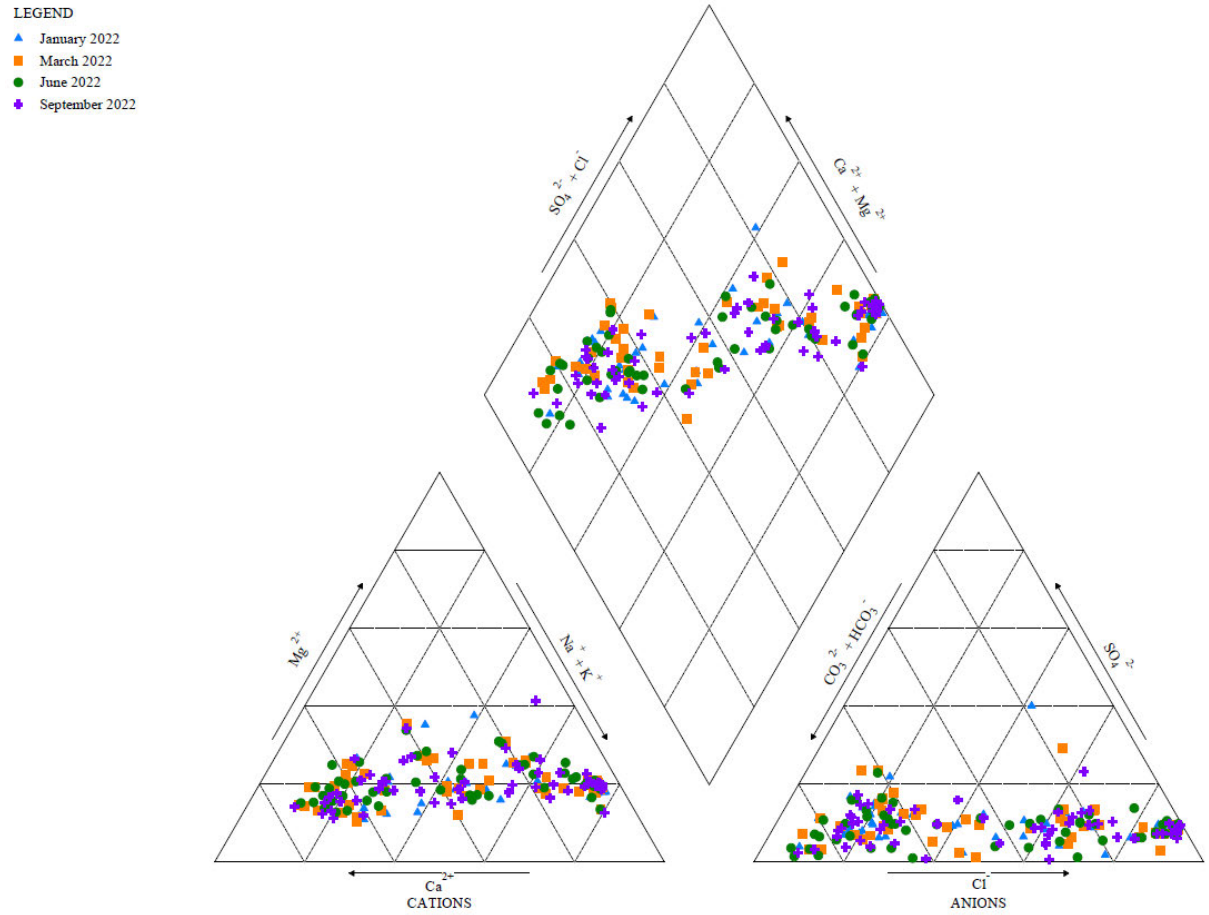
7.1.5 Major Ions Analysis

Major ions analysis was conducted on the groundwater samples collected during each monitoring event to categorise the water type. The results of the groundwater major ion analysis are visually represented in a Piper Diagram shown in Figure 7-10. Two types of water are visible on the diagram:

> Wells closer to the shore are sodium-chloride type due to the influence of saline sea water.

> Inland wells plot in the bicarbonate type.

Figure 7-10 Groundwater Piper Diagram



7.2 Porewater

7.2.2 Porewater Geochemical Parameters

Porewater geochemical parameters recorded during the four quarterly monitoring events (January, March, June, September) are summarised in Table 7-10 and provided within Table 7, Appendix D.

Table 7-10 Porewater Geochemical Parameters

Parameter	January 2022	March 2022	June 2022	Sep 2022
DO	0.11 mg/L (PW329) – 3.33 mg/L (PW381) *Anaerobic to Aerobic conditions.*	0.03 mg/L (PW346) – 5.05 mg/L (PW378) *Anaerobic to Aerobic conditions.*	0.01 mg/L (PW368) – 15.64 mg/L (PW369) *Anaerobic to Aerobic conditions.*	0.38 mg/L (PW368) – 8.48 mg/L (PW380) *Anaerobic to Aerobic conditions.*
EC	28,474 µS/cm (PW368) – 63,330 µS/cm (PW329)	28,413 µS/cm (PW415) – 60,526 µS/cm (PW362)	40,112 µS/cm (PW369) – 55,637 µS/cm (PW331)	8,335 µS/cm (PW304) – 56,245 µS/cm (PW330)
TDS	18,653 mg/L (PW368) – 41,145 mg/L (PW329) *Saline to highly saline conditions.*	18,750 mg/L (PW308) – 38,469 mg/L (PW405) *Saline to Highly saline conditions.*	30,375 mg/L (PW369) – 36,535 mg/L (PW331) *Saline to Highly saline conditions.*	5,974 mg/L (PW304) – 36,569 mg/L (PW330) *Saline to Highly saline conditions.*
pH	7.02 (PW367) – 8.09 (PW381) *Near neutral conditions.*	7.09 (PW346) – 8.06 (PW) *Near neutral conditions.*	7.12 (PW330) – 8.04 (PW375) *Near neutral to slightly alkaline conditions*	7.31 (PW346) – 8.19 (PW401) *Near neutral to slightly alkaline conditions*
ORP	-370.8 mV (PW367) – 192.5 mV (PW340) *Reducing to oxidising conditions.*	-351.8 mV (PW346) – 70.8 mV (PW356) *Reducing to oxidising conditions.*	-280.9 mV (PW357) – 153 mV (PW368) *Reducing to oxidising conditions.*	-327.3 mV (PW368) – 123 mV (PW405) *Reducing to oxidising conditions.*

No seasonal trend was observed in the porewater geochemical parameters. The variability observed in the TDS records is likely related to the tidal movements and influence of seawater ingress.

7.2.3 Porewater Results Summary

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the porewater monitoring locations are presented in the tables below. It is noted that the results are predominantly below LOR and therefore the concentration trends have not been plotted.

7.2.3.2 Fire Training Area

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the FTA monitoring locations is presented in Table 7-11.

- New minimum and maximum concentrations were not identified during the monitoring period.
- Concentrations of PFOS+PFHxS consistently exceeded the marine criteria of 0.00023 µg/L at all wells during 2022.
- No first-time detections of PFOS+PFHxS or PFOA were reported in porewater samples at the FTA.

Table 7-11 FTA porewater PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
PW335	PFOS + PFHxS	0.004 – 0.07	0.02	0.05	0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW340	PFOS + PFHxS	0.004 – 0.28	0.02	0.01	0.03	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW341	PFOS + PFHxS	0.008 – 0.04	0.02	0.02	0.01	0.04
	PFOA	<0.001 -<0.01	<0.01	<0.01	<0.01	<0.01
PW362	PFOS + PFHxS	<0.01 - 0.23	0.02	0.01	0.04	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW363	PFOS + PFHxS	0.006 – 0.04	0.02	0.06	0.01	0.02
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW364	PFOS + PFHxS	<0.01 - 0.04	0.02	0.02	0.03	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
New Maximum		New Minimum			New Exceedance	

7.2.3.3 *Demolition Ground*

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the demolition ground monitoring locations is presented in Table 7-12.

- The majority of results at the demolition ground porewater locations were below the LOR for both Sum of PFOS and PFHxS and PFOA for all events of the monitoring period.
- PW331 recorded one detection above LOR (new maximum) of PFOS+PFHxS in March 2022 (0.01 µg/L).
- PW356 recorded a new exceedance of the Drinking Water criteria for PFOS+PFHxS (0.07 µg/L, 0.10 µg/L detected) in June 2022.

Table 7-12 Demolition ground porewater PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
PW329	PFOS + PFHxS	<0.01 -0.025	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01 - 0.003	<0.01	<0.01	<0.01	<0.01
PW330	PFOS + PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW331	PFOS + PFHxS	0.001 - <0.01	<0.01	0.01	<0.01	<0.01
	PFOA	<0.001 -<0.01	<0.01	<0.01	<0.01	<0.01
PW356	PFOS + PFHxS	0.002 - <0.01	<0.01	<0.01	0.10	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW357	PFOS + PFHxS	0.002 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW358	PFOS + PFHxS	0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01 – 0.001	<0.01	<0.01	<0.01	<0.01
New Maximum		New Minimum			New Exceedance	

7.2.3.4 *Wastewater Treatment Plant*

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the WWTP monitoring locations is presented in Table 7-13.

- New exceedances of the assessment criteria were not identified during the monitoring period, with the exception of PW368 where concentrations were 0.33 µg/L and exceeding the drinking water criteria (0.07 µg/L).
- Samples taken at PW345, PW367 and PW368 reported new maximum concentrations of PFOS+PFHxS between January and June 2022. The maximum concentration was 0.50 µg/L at PW345 but decreased to below the LOR in September 2022.
- The drinking water criteria for PFOS+PFHxS (0.07 µg/L) was seldomly exceeded at PW367, PW368, PW369 during the monitoring period.

Table 7-13 WWTP porewater PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 - September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
PW304	PFOS + PFHxS	<0.01 – 0.09	0.09	0.04	0.02	0.04
	PFOA	<0.01 - 0.003	<0.01	<0.01	<0.01	<0.01
PW345	PFOS + PFHxS	0.02 - 0.144	0.03	0.19	0.50	<0.01
	PFOA	<0.001 -<0.01	<0.01	<0.01	<0.01	<0.01
PW350	PFOS + PFHxS	<0.01 - 4.44	<0.01	0.02	<0.01	0.01
	PFOA	<0.01 - 0.27	<0.01	<0.01	<0.01	<0.01
PW351	PFOS + PFHxS	<0.01 - 0.216	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 -<0.01	<0.01	<0.01	<0.01	<0.01
PW352	PFOS + PFHxS	<0.01 - 0.034	<0.01	<0.01	0.02	<0.01
	PFOA	<0.001 -<0.01	<0.01	<0.01	<0.01	<0.01
PW367	PFOS + PFHxS	<0.01 -0.13	0.06	0.01	0.30	0.01
	PFOA	<0.01 - 0.003	<0.01	<0.01	<0.01	<0.01
PW368	PFOS + PFHxS	<0.01 - 0.054	0.07	0.05	0.33	<0.01
	PFOA	<0.01 - 0.009	<0.01	<0.01	<0.01	<0.01
PW369	PFOS + PFHxS	<0.01 – 0.69	0.06	0.07	0.20	0.11
	PFOA	<0.001 – 0.08	<0.01	<0.01	<0.01	<0.01
PW380	PFOS + PFHxS	<0.01 - 0.868	<0.01	<0.01	<0.01	0.06
	PFOA	<0.01 - 0.001	<0.01	<0.01	<0.01	<0.01
PW381	PFOS + PFHxS	<0.01 - 1.406	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01 - 0.004	<0.01	<0.01	<0.01	<0.01
PW401	PFOS + PFHxS	<0.01 - 3.64	<0.01	0.01	<0.01	<0.01
	PFOA	<0.01 - 0.032	<0.01	<0.01	<0.01	<0.01
New Maximum		**New Minimum**			**New Exceedance**	

7.2.3.5 *Helicopter Support Facility*

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the HSF monitoring locations is presented in Table 7-14.

- Concentrations of PFOS+PFHxS, PFOA and PFOS were reported below the LOR for all samples, with the exception of PW308 during June 2022. The concentration of 0.03 µg/L exceeded the ecological criteria of 0.00023 µg/L (LOR adopted) but returned to below the LOR in September 2022.

Table 7-14 HSF porewater PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-21	Sep-21
PW306	PFOS + PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW307	PFOS + PFHxS	0.001- <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW308	PFOS + PFHxS	0.002 – 0.01	<0.01	<0.01	0.03	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW314	PFOS + PFHxS	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW315	PFOS + PFHxS	0.001 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW316	PFOS + PFHxS	0.001 – 0.10	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01	<0.01	<0.01
PW405	PFOS + PFHxS	<0.01 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW407	PFOS + PFHxS	<0.01 - 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW409	PFOS + PFHxS	<0.01 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW411	PFOS + PFHxS	<0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW413	PFOS + PFHxS	<0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
PW415	PFOS + PFHxS	<0.01 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

7.2.3.3 Accommodation Area

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the accommodation area monitoring location (PW346) is presented in Table 7-15.

- From January to September 2022, PFOS+PFHxS concentrations decreased from above the recreational criteria of 2 µg/L but remained above the drinking water criteria.
- There were no assessment criteria exceedances for PFOA.

Table 7-15 Accommodation Area porewater PFOS+PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
PW346	PFOS + PFHxS	0.01 – 5.62	2.09	1.76	0.48	0.15
	PFOA	<0.01 – 0.06	0.02	<0.01	0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

7.2.3.4 Dredge Spoil and Careening Bay

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the dredge spoil and careening bay monitoring locations is presented in Table 7-16.

> No exceedances, maximum concentrations or first-time detections were recorded during the 2monitoring period at the dredge spoil and careening bay area.

Table 7-16 Dredge spoil and careening bay porewater PFOS+PFHxS and PFOA concentrations (µg/L)

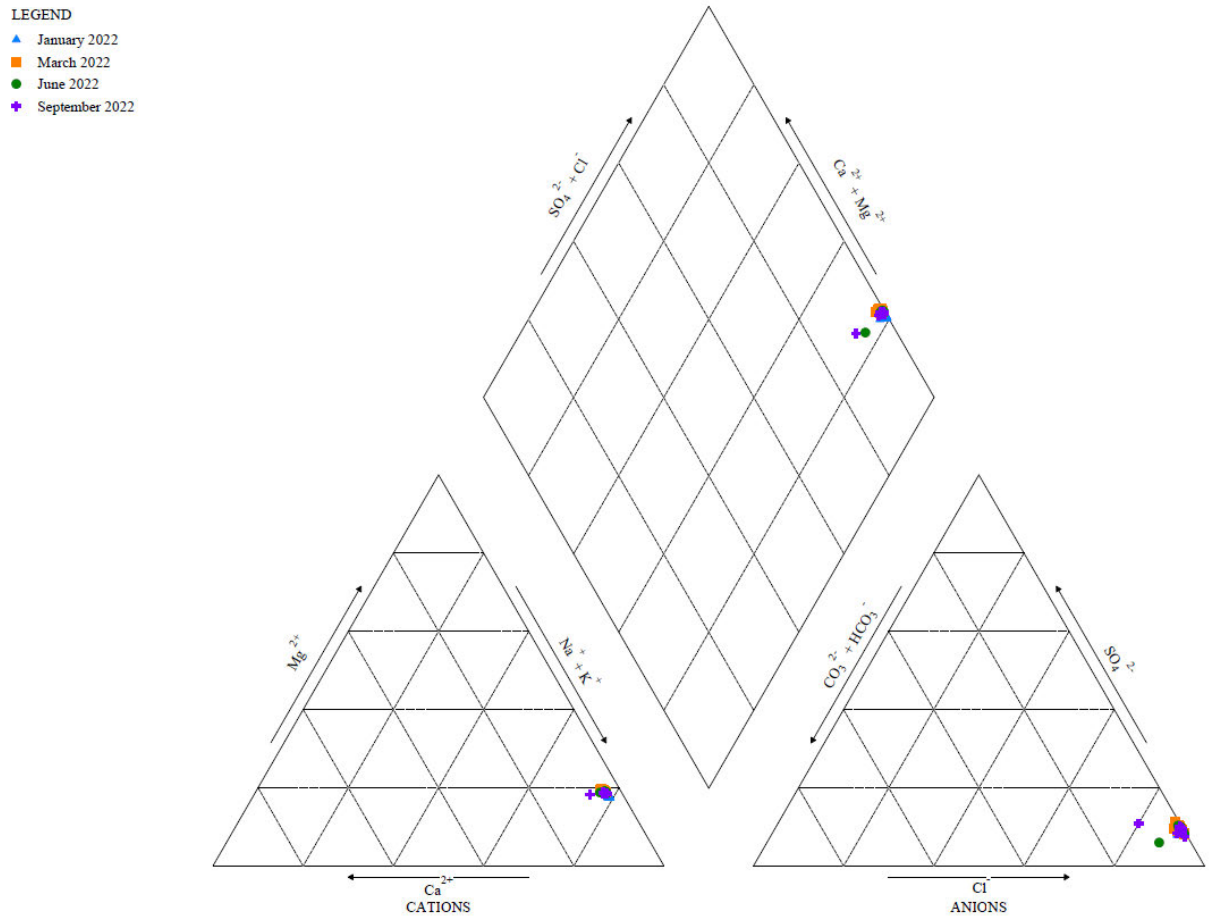
Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
PW374	PFOS + PFHxS	<0.01 – 0.44	0.08	<0.01	<0.01	0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW375	PFOS + PFHxS	0.01 – 0.09	<0.01	0.01	<0.01	0.03
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
PW378	PFOS + PFHxS	<0.01 – 0.12	<0.01	<0.01	<0.01	0.02
	PFOA	0.005 - <0.01	<0.01	<0.01	<0.01	<0.01
New Maximum		**New Minimum**			**New Exceedance**	

7.2.4 Major Ion Analysis

Major ions analysis was conducted on the porewater samples collected during each monitoring event to categorise the water type. The results of the porewater major ion analysis are visually represented in a Piper Diagram shown in Figure 7-11.

Strong influence of the hyper saline sea water is observed on the porewater's ions composition (sodium-chloride water type).

Figure 7-11 Porewater Piper Diagram



7.3 Surface Water

7.3.1 Surface Water Geochemical Parameters

Surface water geochemical parameters recorded during the four quarterly monitoring events are summarised in Table 7-17 and provided within Table 6, Appendix D.

Table 7-17 Surface water Geochemical Parameters

Parameter	January 2022	March 2022	June 2022	September 2022
DO	1.54 mg/L (SW318) – 5.13 mg/L (SW132) *Aerobic conditions*	2.57 mg/L (SW134) – 5.47 mg/L (SW156) *Aerobic conditions*	1.63 mg/L (SW130) – 16.61 mg/L (SW317) *Aerobic conditions*	2.74 mg/L (SW132) – 7.45 mg/L (SW406) *Aerobic conditions*
EC	48,660 µS/cm (SW130) – 58,620 µS/cm (SW305)	54,237 µS/cm (SW309) – 59,788 µS/cm (SW370)	42,762 µS/cm (SW317) – 54,465 µS/cm (SW134)	22,150 µS/cm (SW408) – 54,267 µS/cm (SW152)
TDS	34,608 mg/L (SW408) – 36,270 mg/L (SW373) *Highly saline water*	35,860 mg/L (SW373) – 38,595 mg/L (SW383) *Highly saline water*	34,671 mg/L (SW317)– 36,890 mg/L (SW406) *Highly saline water*	17,838 mg/L (SW408)– 39,053 mg/L (SW353) *Fresh to highly saline water*
pH	8.03 (SW406) – 8.34 (SW416) *Near neutral to slightly alkaline conditions*	7.94 (SW370) – 8.27 (SW318) *Near neutral to slightly alkaline conditions*	7.43 (SW408) – 8.13 (SW318) *Near neutral to slightly alkaline conditions*	6.45 (SW130) – 8.20 (SW383) *Near neutral to slightly alkaline conditions*
ORP	-142.1 mV (SW371) – 131 mV (SW150) *Reducing to oxidising conditions.*	-239.5 mV (SW372) – 85.8 mV (SW3) *Reducing to oxidising conditions.*	-55.7 mV (SW370) – 140.84 mV (SW310) *Reducing to oxidising conditions.*	-235.4 mV (SW371) – 118.2 mV (SW353) *Reducing to oxidising conditions.*

7.3.2 Surface Water Results Summary

7.3.2.2 Fire Training Area

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the FTA monitoring locations is presented in Table 7-18.

> No new exceedances of the assessment criteria or first-time detections were reported during any of the sampling events during the monitoring period.

> PFOA concentrations were consistently reported below the LOR during the monitoring period.

Table 7-18 FTA surface water PFOS and PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SW130	PFOS + PFHxS	<0.01 – 0.05	0.02	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
SW132	PFOS + PFHxS	<0.01 – 0.07	0.02	<0.01	<0.01	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
SW134	PFOS + PFHxS	<0.01 – 0.03	0.03	<0.01	0.02	<0.01
	PFOA	<0.01	<0.01	<0.01	<0.01	<0.01
New Maximum		**New Minimum**			**New Exceedance**	

7.3.2.3 Demolition Ground

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the demolition ground monitoring locations is presented in Table 7-19.

> No detectable concentrations of PFAS were recorded at any of the surface water monitoring locations during the monitoring period.

Table 7-19 Demolition ground surface water PFOS+PFHxS , and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 - September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SW150	PFOS + PFHxS	<0.01 - 0.001	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW152	PFOS + PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW154	PFOS + PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW156	PFOS + PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
New Maximum		**New Minimum**			**New Exceedance**	

7.3.2.4 Wastewater Treatment Plant

Surface water locations are monitored on the east and west shores both sides of the WWTP.

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the WWTP monitoring locations is presented in Table 7-20.

> New exceedance of the drinking water guideline for PFOS+PFHxS was recorded at SW372 (0.11 µg/L) in June 2022. This is also a new maximum for this location.

> In June 2022, SW370 possessed a new maximum concentration of PFOS+PFHxS (0.13 µg/L) which decreased to 0.08 µg/L in September 2022.

> Concentrations of PFOA were consistently reported below the LOR.

Table 7-20 WWTP surface water PFOS+PFHxS , and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
West Shore						
SW353	PFOS+PFHxS	<0.001 – 0.52	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 – 0.01	<0.01	<0.01	<0.01	<0.01
SW382	PFOS+PFHxS	<0.001 – 0.17	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW383	PFOS+PFHxS	0.001 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW384	PFOS+PFHxS	<0.001 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
East shore						
SW370	PFOS+PFHxS	<0.01 – 0.08	0.04	0.02	0.13	0.02
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW371	PFOS+PFHxS	<0.01 - 0.31	0.06	<0.01	0.20	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
East shore (cross-gradient)						
SW305	PFOS+PFHxS	<0.01 – 0.40	0.04	<0.01	0.23	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW372	PFOS+PFHxS	<0.01 - 0.059	0.03	0.05	0.11	0.08
	PFOA	<0.01 - 0.002	<0.01	<0.01	<0.01	<0.01
SW373	PFOS+PFHxS	<0.01 - 0.56	0.05	0.12	<0.01	0.09
	PFOA	<0.01 – 0.01	<0.01	<0.01	<0.01	<0.01

New Maximum **New Minimum** **New Exceedance**

7.3.2.5 Helicopter Support Facility

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the HSF monitoring locations is presented in Table 7-21.

> No detectable concentrations of PFAS were recorded at any of the surface water monitoring locations around the HSF during the monitoring period.

Table 7-21 HSF surface water PFOS and PFHxS, and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SW309	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW310	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW311	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW406	PFOS+PFHxS	<0.001 – 0.02	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW408	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW410	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW412	PFOS+PFHxS	<0.001 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW414	PFOS+PFHxS	<0.001 – 0.04	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW416	PFOS+PFHxS	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
New Maximum		New Minimum			New Exceedance	

7.3.2.6 *Dredge spoil and careening bay*

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the dredge spoil and careening bay monitoring locations is presented in Table 7-22.

> No detectable concentrations of PFAS were recorded at any of the surface water monitoring locations downgradient of the dredge spoil and careening bay during the monitoring period.

Table 7-22 Dredge spoil and careening bay surface water PFOS and PFHxS and PFOA concentrations (µg/L)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SW317	PFOS+PFHxS	0.008 – 0.01	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW318	PFOS+PFHxS	<0.01 - 0.001	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
SW319	PFOS+PFHxS	<0.001 – 0.13	<0.01	<0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01	<0.01	<0.01
New Maximum		New Minimum			New Exceedance	

7.4 Sediment

7.4.1 Sediment Field Observations

Sediment observations recorded during the four quarterly monitoring events (January, March, June and September 2022) are provided within Table 8, Appendix D.

Sediment samples were generally described as wet grey/white coarse sand.

7.4.2 Sediment Results Summary

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the sediment sampling locations are presented in the tables below. It is noted that the results are predominantly below LOR and therefore the results have not been plotted.

7.4.2.2 Fire Training Area

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the FTA monitoring locations is presented in Table 7-23.

- Concentrations of PFOA were consistently reported below the LOR during the monitoring period.
- Concentrations of PFOS and PFOS+PFHxS marginally exceeded their respective LORs in June and September 2022. Concentrations during January and March 2022 were reported below the LOR. New maximum concentrations were identified at SD341 and SD363 during September 2022 with concentrations of 0.0004 mg/kg and 0.0005 mg/kg, respectively.

Table 7-23 FTA sediment PFOS and PFHxS and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2021 - September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SD335	PFOS+PFHxS	<0.0002 – 0.0005	<0.0002	<0.0002	0.0003	0.0003
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD340	PFOS+PFHxS	<0.0002 – 0.0002	<0.0002	<0.0002	0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	0.0002	<0.0002
SD341	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	0.0004
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD362	PFOS+PFHxS	<0.0002 – 0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD363	PFOS+PFHxS	<0.0002 – 0.0002	<0.0002	<0.0002	<0.0002	0.0005
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD364	PFOS+PFHxS	<0.0002 – 0.0006	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

New Maximum **New Minimum** **New Exceedance**

7.4.2.3 Demolition Ground

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the demolition ground monitoring locations is presented in Table 7-24.

> All results for the monitoring period were below the LOR for both Sum of PFOS and PFHxS and PFOA.

Table 7-24 Demolition ground sediment PFOS and PFHxS and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SD329	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD330	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD331	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD356	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD357	PFOS+PFHxS	<0.0002 – 0.0001	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD358	PFOS+PFHxS	<0.0002 – 0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002

New Maximum **New Minimum** **New Exceedance**

7.4.2.4 *Wastewater Treatment Plant*

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the dredge spoil and careening bay monitoring locations is presented in Table 7-25.

- Concentrations of PFOA were consistently reported below the LOR during the monitoring period.
- New maximum concentrations of PFOS+PFHxS were identified at SD369 and SD350 during June 2022.
- First-time detections and new exceedances were not identified during the monitoring period.

Table 7-25 WWTP sediment PFOS and PFHxS and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SD304	PFOS+PFHxS	<0.0002 – 0.0006	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD345	PFOS+PFHxS	<0.0002 – 0.0017	<0.0002	<0.0002	0.0007	0.0016
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD350	PFOS+PFHxS	<0.0002 – 0.0005	<0.0002	0.0002	0.0006	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD351	PFOS+PFHxS	<0.0002– 0.0003	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD352	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD367	PFOS+PFHxS	<0.0002– 0.0011	0.0004	0.0006	0.0008	0.0011
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD368	PFOS+PFHxS	<0.0002 – 0.0010	0.0004	<0.0002	0.0005	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD369	PFOS+PFHxS	<0.0002 – 0.0006	<0.0002	0.0005	0.0021	0.0020
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD380	PFOS+PFHxS	<0.0002 – 0.0003	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD381	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD401	PFOS+PFHxS	<0.0002 – 0.0004	0.0002	<0.0002	0.0003	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002

New Maximum **New Minimum** **New Exceedance**

7.4.2.5 *Helicopter Support Facility*

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the HSF monitoring locations is presented in Table 7-26.

> All results for the monitoring period were below the LOR for both PFOS+PFHxS and PFOA.

Table 7-26 HSF sediment PFOS and PFHxS and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2021 - September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SD306	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD307	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD308	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD314	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD315	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD316	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD405	PFOS+PFHxS	<0.0002 – 0.0003	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD407	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD409	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD411	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD413	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD415	PFOS+PFHxS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

New Maximum **New Minimum** **New Exceedance**

7.4.2.6 Accommodation Area

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the accommodation area monitoring locations is presented in Table 7-27.

- Concentrations of PFOA were consistently reported below the LOR during the monitoring period.
- A new maximum concentration of PFOS+PFHxS was identified at SD346 during March 2022 (0.0177 mg/kg) but decreased in magnitude in June and September 2022.

Table 7-27 Accommodation area sediment PFOS and PFHxS and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SD346	PFOS+PFHxS	0.0006 – 0.0116	0.0032	0.0177	0.0019	0.0025
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
New Maximum		**New Minimum**		**New Exceedance**		

7.4.2.7 Dredge Spoil and Careening Bay

A summary of the PFOA and PFOS+PFHxS concentrations for the monitoring period and the historical concentration ranges for the dredge spoil and careening bay monitoring locations is presented in Table 7-28.

- Concentrations of PFOA were consistently reported below the LOR during the monitoring period.
- SD374 recorded a new PFOS+PFHxS concentration maximum, marginally above historical range, in September 2022.
- There were no new exceedances or first-time detections for PFOS+PFHxS and PFOA during the monitoring period.

Table 7-28 Dredge spoil and careening bay sediment PFOS and PFHxS and PFOA concentrations (mg/kg)

Location ID	Analyte	Historical range	October 2021 – September 2022 Monitoring Period			
		Min – Max	Jan-22	Mar-22	Jun-22	Sep-22
SD374	PFOS+PFHxS	<0.0002 – 0.0004	<0.0002	<0.0002	0.0003	0.0006
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD375	PFOS+PFHxS	<0.0002 – 0.0006	0.0002	<0.0002	0.0003	0.0003
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
SD378	PFOS+PFHxS	<0.0002 – 0.0005	<0.0002	<0.0002	0.0003	0.0002
	PFOA	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
New Maximum		**New Minimum**		**New Exceedance**		

8 Interpretive Analysis

The following sections present a high-level interpretation for each monitoring area, based on the available data set for each media monitored. The data used for the interpretive analysis include groundwater monitoring data obtained since 2017, porewater and surface water monitoring data collected since March 2018 and sediment monitoring data collected since January 2020.

Trends in groundwater concentrations over time have been assessed using the Mann-Kendall trend test to assess the plume stability. A minimum of four results per monitoring location are required to calculate a potential trend (i.e., increasing, stable or decreasing). The Mann Kendall test relies on several statistical metrics, including:

- The Mann Kendall **'S' Statistic** indicates whether concentration trend versus time is generally decreasing (S<0) or increasing (S>0). Where the value is zero, there is no overall trend.
- The **Confidence Factor (CF)** value indicates the degree of confidence in the trend result as in "Decreasing" vs. "Probably Decreasing" or "Increasing" vs. "Probably Increasing". A CF between 90% and 95% indicate a "Probably" increasing or decreasing trend, when CF>95% the data demonstrate a strong trend, either "Increasing" or "Decreasing".
- The **Coefficient of Variation (CoV)** is used to distinguish between a 'No Trend' result and a 'Stable' result for a dataset with no significant increasing or decreasing trend.

For practicality, GSI (2012) outlines that a "No trend" result can be considered as evidence that concentrations are nor increasing or decreasing at the relevant sampling location, similar to a "Stable" trend result.

Mann Kendall test results are presented in Appendix D and summarised in the following sections.

The outcomes of the Mann-Kendall statistical analysis are to be read in conjunction with the associated confidence factors and the spatial location of the monitoring wells to assess plume stability. The overall plume stability condition can be characterised by looking at concentration trends at individual locations and plume length vs time (GSI, 2012).

8.1 Fire Training Area

The spatial extent of groundwater, porewater and surface water Sum of PFOS and PFHxS concentrations at the FTA is shown (Appendix A) in Figure 8B (Jan-22), Figure 9B (Mar-22), Figure 10B (Jun-22) and Figure 11B (Sept-22). The PFOA concentrations are displayed in Figure 12B (Jan-22), Figure 13B (Mar-22), Figure 14B (Jun-22) and Figure 15B (Sept-22). The sediment Sum of PFOS and PFHxS results are shown in Figure 16B (Jan-22), Figure 17B (Mar-22), Figure 18B (Jun-22) and Figure 19B (Sept-22).

Groundwater

Groundwater monitoring wells MW109, MW112, MW117, MW120, MW121, MW123 and MW128 are targeting the FTA source area and MW124, MW125, MW126 and MW127 are positioned downgradient, along the shoreline.

Table 8-1 Mann-Kendall Trend Analysis Summary – Fire Training Area

Location	PFOS Trend	Confidence Factor (%)	PFOA Trend	Confidence Factor (%)	PFOS+PFHxSTrend	Confidence Factor (%)
MW109	Increasing	97	Decreasing	>99	Stable	72
MW112	No Trend	88	Stable	80	Increasing	>99
MW120	No Trend	13	No trend	79	No Trend	75
MW121	No Trend	9	No trend	61	No Trend	66
MW123	Decreasing	>99	Decreasing	96	Stable	65
MW124	Decreasing	>99	No Trend	<1	Decreasing	>99
MW125	No Trend	95	Stable	89	Increasing	96
MW126	Decreasing	>99	NA(1)	NA(1)	Decreasing	99
MW127	Decreasing	>99	Stable	74	Decreasing	>99
MW128	No Trend	50	Stable	82	No Trend	50
MW500	Possibly Increasing	91	Stable	27	No Trend	27

Notes:

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered “stable” for the purpose of trend analysis .

The results of the Mann-Kendall analysis indicate primarily decreasing or stable trends in PFOS, PFOA, and PFOS+PFHxS across the monitoring well network. The only increasing trends were identified at MW109 (PFOS) and MW112 (PFOS+PFHxS).

The presence of elevated concentrations of PFOS+PFHxS at wells situated on the downgradient (eastern) boundary of the FTA (MW109, MW128) and exceeding the recreational criteria suggests that these magnitudes of concentrations extend past the FTA and towards the shoreline.

PFOS+PFHxS concentrations at wells located adjacent the shoreline were one to two orders of magnitude lower than the source area wells, e.g., MW500. Concentrations at MW125, the downgradient well with the highest PFOS+PFHxS concentrations exhibited increasing stable trends, however, the statistical confidence was not high.

The results of the plume stability analysis at the downgradient wells show stable or decreasing trends where a trend could be established. These wells (MW124, MW125, MW126 and MW127) are anticipated to be influenced by the tides as shown by the TDS and EC readings, and ions concentrations (indicating a more saline water than inlands wells) which could play a role in PFAS dilution.

Porewater

PFOS+PFHxS concentrations (maximum of 0.06 µg/L and below the drinking water criteria) were recorded above the LOR at all porewater locations during the monitoring period. It is noteworthy that, concentrations of PFOS+PFHxS at some locations (PW340 and PW362) have decreased since March 2021.

Consistent with previous investigations, the detection of minor concentrations suggests the migration of PFAS from the FTA. However, the relatively low level of detections compared to groundwater concentrations upgradient indicates dilution in sea water is occurring. This is supported by the geochemical parameters’ records showing a salinity increase in porewater when compared to groundwater.

Surface water

Detectable concentrations of PFOS and PFOS+PFHxS were occasionally identified in surface water samples collected over the monitoring period where PFOA was consistently reported below the LOR. There were no new exceedances of the assessment criteria nor new maximum or minimum concentrations.

Sediment

Detectable concentrations of PFOS and PFOS+PFHxS were occasionally identified in sediment samples collected over the monitoring period where PFOA was consistently reported below the LOR. Although new maximum concentrations were identified at SD341 and SD363 in September 2022, they were marginally reported above the LOR.

The 2021 AIR indicated a potential relationship between elevated PFOS+PFHxS concentrations in porewater and sediment samples in the same locations during the same sampling event. However, based on the results of the October 2021 – September 2022 monitoring, this conclusion is not supported.

8.2 Demolition Ground

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the Demolition Ground is shown (Appendix A) in Figure 8A (Jan-22), Figure 9A (Mar-22), Figure 10A (Jun-22) and Figure 11A (Sept-22). The PFOA concentrations are displayed in Figure 12A (Jan-22), Figure 13A (Mar-22), Figure 14A (Jun-22) and Figure 15A (Sept-22). The sediment results are shown in Figure 16A (Jan-22), Figure 17A (Mar-22), Figure 18A (Jun-22) and Figure 19A (Sept-22).

Groundwater

MW139 is targeting the Demolition Ground source area, MW141 and MW147 are located directly downgradient; and MW142 and MW149 are situated along the shoreline.

Table 8-2 Mann-Kendall Trend Analysis Summary – Demolition Ground

Location	PFOS Trend	Confidence Factor (%)	PFOA Trend	Confidence Factor (%)	PFOS+PFHxS Trend	Confidence Factor (%)
MW139	No Trend	75	No Trend	84	Possibly Decreasing	93
MW141	Possibly Increasing	93	No Trend	17	Stable	28
MW142	Increasing	98	Increasing	>99	Increasing	>99
MW147*	No Trend	85	No Trend	87	Increasing	98
MW149	Decreasing	98	NA (2)	NA (2)	Decreasing	>99

**Note: ***This well hasn't been sampled during the monitoring period.

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered "stable" for the purpose of trend analysis.

The results of the plume stability analysis indicate no statistically significant trend at MW139 (source area) for PFOS or PFOA, however PFOS+PFHxS concentrations were indicated to be possibly decreasing.

Downgradient wells, MW141 and MW142, consistently reported the highest PFOS+PFHxS concentrations, above the recreational criteria of 2 µg/L. PFOA concentrations were also recorded above the HEPA (2020) drinking water guideline value. Stable or increasing trends were also identified at these wells suggesting that migration is still occurring.

MW149, positioned downgradient and south of MW141, MW142 and MW147, largely had concentrations that were reported below the LOR. Decreasing trends for PFOS and PFOS+PFHxS were also identified at that well. The absence of elevated PFAS concentrations suggests that PFAS is primarily situated directly east of MW139 and in the vicinity of MW141, MW142 and MW147.

Porewater & Surface Water

PFAS concentrations in porewater samples were reported below the LOR in all samples, with the exception of PW331 and PW356. Both locations are situated north of where elevated concentrations were identified in groundwater. PFAS concentrations in groundwater were also reported below the LOR throughout the monitoring period.

Given the prominence of concentrations reported below the LOR in porewater and surface water locations, it is considered that dilution in sea water is occurring. This conclusion is consistent with the findings of the 2021 AIR. This is supported by higher TDS and EC readings at the porewater locations and monitoring wells near the coastline indicating a mixing of groundwater with saline sea water.

Sediment

No detectable concentration of PFAS was reported at any of the sediment monitoring locations downgradient of the demolition ground which is consistent with the previous monitoring period.

8.3 Wastewater Treatment Plant

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the WWTP is shown (Appendix A) in Figure 8B (Jan-22), Figure 9B (Mar-22), Figure 10B (Jun-22) and Figure 11B (Sept-22). The PFOA concentrations are displayed in Figure 12B (Jan-22), Figure 13B (Mar-22), Figure 14B (Jun-22) and Figure 15B (Sept-22). The sediment PFOS+PFHxS results are shown in Figure 16B (Jan-22), Figure 17B (Mar-22), Figure 18B (Jun-22) and Figure 19B (Sept-22).

The WWTP is located at the centre of Garden Island. Groundwater flow is interpreted to be radial for this area and therefore, monitoring locations are positioned both on the east and west of the WWTP.

Groundwater

Wells MW171, MW172, MW173, MW193, MW195S and MW195D are located around the WWTP. MW161 and MW166 are located adjacent to the seepage ponds. MW158, MW196, MW199 and MW203 are situated between the WWTP and the shoreline to the east. MW197, MW200, and MW202 are located along the coastline to the east/southeast of the WWTP.

Table 8-3 Mann-Kendall Trend Analysis Summary – WWTP

Location	PFOS Trend	Confidence Factor (%)	PFOA Trend	Confidence Factor (%)	PFOS+PFHxS Trend	Confidence Factor (%)
MW158	No Trend	75	NA (1)	NA (1)	No Trend	75
MW161	Decreasing	98	No Trend	43	Decreasing	98
MW166	No Trend	62	No Trend	70	No Trend	73
MW171	Decreasing	98	Decreasing	>99	Decreasing	99
MW173	Increasing	>99	Increasing	99	Increasing	>99
MW193	Stable	3	No Trend	57	No Trend	73
MW195D	No Trend	<1	No Trend	86	No Trend	10
MW195S	No Trend	83	No Trend	<1	Decreasing	>99
MW196	NA (1)	NA (1)	NA (1)	NA (1)	Stable	84
MW197	Possibly Decreasing	93	Stable	31	Decreasing	98
MW199	No Trend	86	Stable	48	Decreasing	95
MW200	No Trend	88	NA (1)	NA (1)	No Trend	88
MW202	Decreasing	97	Stable	53	Decreasing	99
MW203	No Trend	>99	NA (1)	NA (1)	Possibly Increasing	91

Notes: MW172 only has three data points which is not enough for statistical analysis.

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered “stable” for the purpose of trend analysis.

Concentrations of PFOS+PFHxS consistently exceeded the recreational criteria of 2 µg/L at MW161, MW166, MW173 and MW193, all located west of the WWTP. The other wells remained within one order of magnitude of the LOR, suggesting that PFAS is migrating in a westerly direction from WWTP infrastructure. Of these wells, concentrations were either stable or decreasing at MW161, MW166, and MW193. Increasing trends of PFOS, PFOA, and PFOS+PFHxS were identified at MW173.

Wells positioned east of the WWTP, MW195S, MW195D, and MW196, possessed concentrations of PFAS that were either marginally detected above the LOR or below the LOR. The absence of elevated PFAS east of the WWTP further supports the notion that PFAS is migrating downgradient in a westerly direction.

Porewater

PW350, PW401, PW380, PW351, PW381 and PW352 are located on the western shoreline, downgradient of the WWTP and seepage ponds. PW369, PW367 and PW345 are located on the eastern shoreline.

Concentrations of PFOS+PFHxS were identified above the LOR in all porewater samples, except for PW351 and PW041 (both on the western shoreline). The highest concentrations of PFOS+PFHxS were identified at PW345, PW367, PW368, and PW369 where the drinking water criteria were exceeded on at least one

occasion during the monitoring period. These increased concentrations appeared to be temporally isolated when compared to concentrations reported in prior and/or subsequent monitoring events.

Surface water

Concentrations of PFAS in surface water samples collected from the western shoreline were reported below the LOR throughout the monitoring period. In contrast, elevated concentrations of PFOS and PFOS+PFHxS were identified in surface water samples from the eastern shoreline where the marine (99%) criteria were exceeded. PFOS+PFHxS concentrations at PW371 seldomly exceeded the drinking water criteria of 0.07 µg/L during January and June 2022, however, was reported below the LOR in March and September 2022. The variability of results is likely due to the mixing and dilution effect of sea water and groundwater.

Sediment

Sediment PFAS concentrations were generally below the LOR, or at concentrations of the same order of magnitude as the LOR which is consistent with the previous monitoring period. It is interpreted that PFAS does not accumulate within the sediment at the site and the primary transport media is groundwater.

8.4 Helicopter Support Facility

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the HSF is shown (Appendix A) in Figure 8C (Jan-22), Figure 9C (Mar-22), Figure 10C (Jun-22) and Figure 11C (Sept-22). The PFOA concentrations are displayed in Figure 12C (Jan-22), Figure 13C (Mar-22), Figure 14C (Jun-22) and Figure 15C (Sept-22). The sediment PFOS+PFHxS results are shown in Figure 16C (Jan-22), Figure 17C (Mar-22), Figure 18C (Jun-22) and Figure 19C (Sept-22).

Groundwater

Wells MW216, MW217, MW220, MW224 and MW282 are targeting the HSF source area. MW214, MW215, MW225 and MW226 are located between the source area and the shore.

Table 8-4 Mann-Kendall Trend Analysis Summary – HSF

Location	PFOS Trend	Confidence Factor (%)	PFOA Trend	Confidence Factor (%)	PFOS+PFHxS Trend	Confidence Factor (%)
MW214	NA (1)	NA (1)	NA (1)	NA (1)	NA (1)	NA (1)
MW215	NA (1)	NA (1)	No Trend	<1	Increasing	98
MW216	Increasing	>99	Increasing	>99	Increasing	99
MW217	Decreasing	99	Increasing	99	Decreasing	98
MW220	Probably Increasing	91	Increasing	96	Increasing	>99
MW224	No Trend	<1	NA (1)	NA (1)	No Trend	5
MW225	No Trend	89	NA (1)	NA (1)	Possibly Decreasing	94
MW226	Stable	75	NA (1)	NA (1)	No Trend	90
MW227	Decreasing	99	NA (1)	NA (1)	Decreasing	99
MW228	Stable	82	Increasing	>99	Increasing	>99
MW282	Stable	10	Stable	72	Stable	73

Notes:

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered “stable” for the purpose of trend analysis.

The highest concentrations of PFOS+PFHxS were identified at wells MW216, MW220, and MW282, all positioned in the immediate vicinity of the HSF where the recreational criteria was consistently exceeded. However, the 2021 AIR reported a degree of variability in concentrations across the HSF area and this is supported by the October 2021 – September 2022 findings. Other wells positioned within the HSF, MW215, MW217, and MW224 reported elevated concentrations, albeit lower compared to the aforementioned wells.

PFAS concentrations at wells MW216, MW220, and MW282 were also indicated to be increasing for the most part. Whilst wells positioned downgradient of these (MW214, MW215, MW227, and MW228) possessed lower concentrations, trend analysis indicated mixed results.

- MW214 (positioned downgradient of MW216): Stable concentrations of PFOA, PFOS, and PFOS+PFHxS (all reported consistently below the LOR).
- MW215 (positioned downgradient of MW282): Increasing trends of PFOS+PFHxS where concentrations remain above the drinking water criteria, but lower than the recreational criteria.
- MW227 (positioned on eastern shoreline): Either decreasing or stable trends in PFAS concentrations.
- MW228 (positioned on eastern shoreline): Increasing trends for PFOA and PFOS+PFHxS where concentrations remain above the drinking water criteria.

Porewater

PFOS+PFHxS concentrations were only detected above the LOR at PW038 in June 2022. All other concentrations were reported below the LOR. The detection still suggests that the plume is migrating to the shoreline but dispersion and dilution mechanisms are prominent factors within the receiving environment.

Surface water

All HSF surface water samples reported PFAS concentrations below the LOR during the monitoring period. This is synonymous with the absence of elevated concentrations in porewater.

Sediment

All HSF sediment samples reported PFAS concentrations below the LOR during the monitoring period. This is synonymous with the absence of elevated concentrations in surface water samples.

8.5 AVCAT Storage, fuel farm and infiltration swale

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the AVCAT storage, fuel farm and infiltration swale are shown (Appendix A) in Figure 8C (Jan-22), Figure 9C (Mar-22), Figure 10C (Jun-22) and Figure 11C (Sept-22). The PFOA concentrations are displayed in Figure 12C (Jan-22), Figure 13C (Mar-22), Figure 14C (Jun-22) and Figure 15C (Sept-22). The sediment PFOS+PFHxS results are shown in Figure 16C (Jan-22), Figure 17C (Mar-22), Figure 18C (Jun-22) and Figure 19C (Sept-22).

Groundwater only is monitored for the AVCAT storage, fuel farm and infiltration swale as other sources are present closer to the shoreline.

Table 8-5 Mann-Kendall Trend Analysis Summary – AVCAT storage, fuel farm and infiltration swale

Location	PFOS Trend	Confidence Factor (%)	PFOA Trend	Confidence Factor (%)	PFOS+PFHxS Trend	Confidence Factor (%)
Infiltration Swale						
MW233	Possibly Decreasing	93	Decreasing	99	Decreasing	>99
Fuel Farm						
MW236	Increasing	>99	Increasing	99	Increasing	>99
AVCAT Storage						
MW238	Decreasing	99	NA (2)	NA (2)	Stable	33
MW239	No Trend	<1	NA (2)	NA (2)	No Trend	70
MW240	No Trend	88	Stable	38	Stable	5
MW242	No Trend	<1	NA (2)	NA (2)	No Trend	<1
MW243	No Trend	51	Decreasing	96	No Trend	73
MW245	Decreasing	>99	Decreasing	99	Decreasing	>99
MW516	Stable	65	Stable	30	Stable	72
MW249	Decreasing	>99	Decreasing	>99	Decreasing	>99

Notes:

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered “stable” for the purpose of trend analysis.

The infiltration swale monitoring well, MW233, consistently reported PFOS+PFHxS concentrations above the drinking water guideline value but below the recreation guideline. Additionally, decreasing trends were identified for PFOS, PFOA, and PFOS+PFHxS, which is consistent with the 2021 AIR findings.

The fuel farm well, MW236, displayed increasing trends in PFOS, PFOA, and PFOS+PFHxS, which is consistent with previous findings. PFOS+PFHxS continue to exceed the recreational criteria in all samples.

The highest PFOS+PFHxS concentrations in the AVCAT storage wells were identified at MW240 (within the source area), and MW516, however, concentrations trends were indicated to be stable. Overall, no major changes are noted in comparison to the 2021 AIR.

8.6 Fire Station, Dredge Spoil and Ship Sullage Area

The spatial extent of groundwater, porewater and surface water PFOS+PFHxS concentrations at the Fire station and ship sullage area is shown (Appendix A) in Figure 8C (Dec-20), Figure 9C (Mar-21), Figure 10C (Jun-21) and Figure 11C (Sept-21).

Groundwater

All the wells are targeting a specific source area:

- MW517, MW255 and MW256 are located at the Fire Station.
- MW257, MW258 (dry) and MW259 are located at the flammable / hazardous goods and waste storage area.
- MW264, MW268 and MW269 are targeting the dredge spoil; and
- MW518, MW261 and MW010 are located at the ship sullage area.

Table 8-6 Mann-Kendall Trend Analysis Summary – Fire Station, dredge spoil and ship sullage area

Location	PFOS Trend	Confidence Factor (%)	PFOA Trend	Confidence Factor (%)	PFOS+PFHxS Trend	Confidence Factor (%)
Fire Station						
MW255	Decreasing	99	Possibly Decreasing	94	No Trend	66
MW256	Increasing	99	Increasing	99	Increasing	98
Flammable / hazardous goods and waste storage area						
MW257	No Trend	15	No Trend	37	No Trend	76
MW258	No Trend	29	No Trend	<1	No Trend	68
MW259	Decreasing	>99	Decreasing	>99	Decreasing	>99
Ship sullage area						
MW261	Probably Decreasing	93	NA (1)	NA (1)	No Trend	38
Dredge spoil						
MW268	No Trend	87	Decreasing	>99	Stable	18
MW269	No Trend	68	Possibly Increasing	94	Increasing	97

Notes:

(1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered “stable” for the purpose of trend analysis.

MW256, positioned downgradient of the Fire Station, recorded higher concentrations of PFOS+PFHxS and PFOS compared to MW255. Migration of PFAS is likely to be occurring in an easterly direction given the increasing trends in concentrations of PFOA, PFOS, and PFOS+PFHxS at MW256 where the recreational criteria for PFOS+PFHxS was consistently exceeded.

Wells positioned in the vicinity of the waste storage area (MW257, MW258 and MW259) possessed elevated concentrations of PFOS, PFOA and PFOS+PFHxS that exceeded the marine (99%) and drinking water criteria. The highest concentrations were seen at MW258, however, statistical analysis was unable to

determine a trend given that the well was only sampled twice. Concentrations at MW259 were indicated to be decreasing with a high degree of statistical confidence.

Ship sullage area well, MW261, displayed a potential decreasing trend in PFOS+PFHxS (indicated to be increasing during the 2021 AIR monitoring period), however, trends could not be statically established for PFOS and PFOA due to concentrations being reported below the LOR.

Wells targeting the dredge spoil displayed an increasing trend for PFOS+PFHxS at MW269 (east of source area) and remaining stable at MW268. The results are largely consistent with the 2021 AIR.

8.7 Accommodation Area

The spatial extent of groundwater, porewater and surface water Sum of PFOS and PFHxS concentrations at the Accommodation Area is shown (Appendix A) in Figure 8C (Dec-20), Figure 9C (Mar-21), Figure 10C (Jun-21) and Figure 11C (Sept-21).

Groundwater

Consistent with the 2021 AIR findings, the highest PFAS concentrations were seen at MW288 where PFOS+PFHxS regularly exceeded the recreation criteria of 2 µg/L. However, concentrations of PFOS+PFHxS including PFOS and PFOA were indicated to be decreasing with a high degree of statistical confidence. MW289 targeting the accommodation area generally recorded PFOS+PFHxS concentrations of the same order of magnitude as the recreational criteria.

Table 8-7 Mann-Kendall Trend Analysis Summary – Accommodation Area

Location	PFOS Trend	Confidence Factor (%)	PFOA Trend	Confidence Factor (%)	PFOS+PFHxS+	Confidence Factor (%)
MW288	Decreasing	99	Decreasing	99	Decreasing	>99
MW289	Decreasing	97	Possibly Increasing	92	Stable	68

Porewater/Sediment

Elevated concentrations of PFOS, PFOA and PFOS+PFHxS were identified at the co-located porewater/sediment location (PW/SD346), positioned downgradient of the source area. Concentrations were generally higher in the porewater sample where the marine (99%) criteria were exceeded by up to three orders of magnitude. PFOS+PFHxS concentrations in porewater appeared to be decreasing over the monitoring period.

Surface water

Surface water is not monitored directly downgradient of the identified source area, however, SW305, SW372 and SW373 to the north have consistently reported detectable PFOS concentrations and therefore exceedances of the marine (99%) criteria. This is likely to be related to the WWTP source area.

8.8 Summary

A summary of the maximum PFOS+PFHxS concentrations historically recorded, and the maximum concentrations recorded during the monitoring period are presented in Table 8-8 for each media assessed and investigation area.

Table 8-8 Maximum detected Sum of PFOS and PFHxS concentrations

Investigation Area	PFOS+PFHxS Maximum Concentrations				
	Phase	Groundwater (µg/L)	Porewater (µg/L)	Surface water (µg/L)	Sediment (mg/L)
Fire Training Area	Historical	87.9	0.28	0.07	0.0005
	2022	81.2	0.06	0.03	0.0005
Demolition Ground	Historical	147	0.025	0.001	<0.0001
	2022	201	0.1	0.001	<0.0001
WWTP	Historical	21.7	4.44	0.56	0.0017
	2022	29.7	0.33	0.13	0.0021
Helicopter Support Facility	Historical	243	0.1	0.04	0.0011
	2022	143	0.03	0.001	0.0016
AVCAT storage and Fuel farm	Historical	87.5	-	-	-
	2022	117	-	-	-
Fire Station, dredge spoil and ship sullage area	Historical	75.0	0.44	0.13	0.0005
	2022	24.8	-	0.001	0.0005
Accommodation Area	Historical	13.1	5.62	-	0.0116
	2022	4.65	2.09	-	0.0025

It is noted that concentrations maximums are within one order of magnitude of historical data with the following exceptions:

- WWTP: Maximum concentrations in porewater decreased by one order of magnitude from 4.44 µg/L to 0.33 µg/L (PW368).
- Dredge Spoil and Careening: Surface water concentrations decreased to below the LOR.

9 Conceptual Site Model (CSM)

A review of the CSM presented in the PMAP (Defence, 2019) has been undertaken.

The evaluation of analytical results within this report does not suggest the nature and extent of PFAS in groundwater, porewater, surface water or sediment has significantly changed compared to that inferred from previous reporting. No new pathway, exposure scenario or potential receptors were identified.

An update of the CSM is however required to include the new source areas identified (GHD, 2020).

10 Discussion

The potential exposure pathways for human health and ecological receptors identified during the DSI (RPS, 2018a) and ERA (RPS, 2018b) have been reviewed in light of the monitoring data obtained during the monitoring period.

As stated in the PMAP, "*Contaminant fate and transport modelling (calculated to 2100) indicates that PFAS concentrations are expected to increase along the coastline to the future*". The observations made since the start of the OMP implementation confirm this indication. Concentrations in surface water and/or porewater have been recorded one to two orders of magnitude above the investigation phase's dataset.

The pathways for PFAS exposure and risks to human health and ecological receptors presented in the investigation phase (RPS, 2018a, b) are considered to still be relevant for the site, and data presented in this report does not suggest any significant changes to these mechanisms or risks.

10.1 Risk Profile

No elevated risks requiring specific management actions were identified in the PMAP following completion of the DSI (RPS, 2018a) and ERA (RPS, 2018b). It is however noted that abstraction of groundwater on Garden Island is restricted for potential future use due to the presence of PFAS (PMAP, Defence, 2019).

There is no significant change to the risk profile of the Management Area based on the current available data based on the following lines of evidence:

- Elevated concentrations of PFAS in porewater and surface water were observed downgradient of several source areas, including the FTA, WWTP, HSF, Careening Bay and Accommodation area. The magnitude of concentrations in porewater and surface water were generally lower than those in groundwater wells, suggesting that the energy intensive environment of the marine shoreline is diluting and dispersing PFAS. This is supported by the geochemical parameters' records showing a salinity increase in porewater and surface water when compared to groundwater.
- Exceedances of the drinking water guideline for PFOS+PFHxS were reported within the monitoring period for surface water samples downgradient of the WWTP (SW370, SW372, and SW373). All surface water concentrations were below the recreational criteria and therefore do not present a risk to recreational users.
- The recreational criteria were marginally exceeded in porewater downgradient of the accommodation (PW346) in January 2022. However, concentrations continued to decrease below the criteria and therefore do not present a risk to recreational users.

10.2 Triggers for OMP review

The OMP is to be reviewed annually considering existing trend data available to tailor the monitoring program to site-specific characteristics. A review of the OMP may be required for several reasons including (but not limited to):

- Policy changes, regulatory requirements, or regulator advice.
- Feedback and information received as part of stakeholder engagement activities.
- A change in the understanding of the risk for the site.
- Significant changes of land use within the Management Area or at close proximity.
- Impacts of remediation works; and

> The requirements of a post-remediation Site Management Plan.

The newly identified potential PFAS sources (GHD, 2020) should trigger a review of the OMP to ensure these areas are adequately monitored.

In addition, and as detailed in Section 3.2, some changes to the groundwater monitoring network have been noted since the OMP and should be incorporated in a revised OMP.

Furthermore, the initial 24-month implementation period has been reached which triggers a review of the OMP.

11 Conclusions

Cardno implemented the OMP at HMAS Stirling (Garden Island) which comprised sampling and testing of groundwater, surface water, porewater and sediment. The October 2021 – September 2022 monitoring program consisted of four quarterly monitoring events (undertaken in January 2022, March 2022, June 2022 and September 2022).

The purpose of this Ongoing Monitoring Interpretive Report was to:

- Inform Defence and key stakeholders of PFAS trends in groundwater, surface water, porewater and sediment.
- Assess any variations in the distribution of PFAS for the Management Area and how this changes the understanding of the conceptual site model and risk profile.

Recommendations for any potential changes in the location and frequency of sampling which may be incorporated in the revision of the OMP will be provided to Defence under a separate document if required.

The October 2021 – September 2022 OMP monitoring was undertaken in general accordance with the SAQP (Cardno 2022, Appendix B) and is considered to have met the objectives of the OMP.

Groundwater

228 groundwater samples were collected during the monitoring period. 73 of the 228 samples (32%) possessed elevated concentrations that exceeded the recreational criteria of 2 µg/L. The highest concentrations of PFHxS+PFOS were seen at MW141, located within the Demolition Ground.

Generally, the magnitude of PFAS concentrations in groundwater were similar to the magnitudes identified during the 2021 AIR monitoring period. Elevated concentrations of primarily PFOS and PFHxS+PFOS were generally higher in source areas and lower in downgradient area and towards the shoreline. PFOA concentrations across the monitoring network were generally reported below the LOR or marginally above.

Porewater

Of the 39 pore water sampling locations sampled during the monitoring period, 17 recorded concentrations of PFOS+PFHxS below the LOR at any stage of the monitoring period. PFOA was reported below the LOR in 154 of the 156 samples analysed.

63% of the 156 porewater samples collected during the monitoring period were below the LOR for PFOS+PFHxS. Detectable concentrations ranged from 0.01 to 2.09 µg/L (PW346, accommodation area). The concentrations generally indicate dilution of the PFAS plume in groundwater, attributed to the tides.

Surface Water

9% of surface water samples collected during the monitoring period possessed detectable concentrations PFOS+PFHxS. All other samples were reported below the LOR. The highest concentrations were seen at SW370, SW373, and SW373, however, the recreation criteria were not exceeded and potential risks to human health are not considered to be present.

Sediment

Out of 156 sediment samples collected during the four sampling events of the monitoring period, 31 were marginally above the LOR and no assessment criteria exceedances were reported. No changes in the nature and extent of PFAS in sediment are observed.

It is interpreted that PFAS are not accumulating within the sandy sediments at the site coastline. Dilution with porewater/sea water appears to be occurring faster than any binding mechanism.

Conceptual Site Model

A review of the CSM was undertaken based on the October 2021 – September 2022 monitoring data. No new exposure pathway, receptor or transport mechanism were identified.

Risk Summary

No change in the risk profile of the Management Area or a specific monitoring area was established. The risk posed by residual PFAS at the site remains a low risk to human health and ecological receptors based on the available data set.

12 References

General References

1. Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds*.
2. Australian and New Zealand Guidelines, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.
3. Bureau of Meteorology, Climate Data Online (http://www.bom.gov.au/climate/data/?ref=ftr)
4. *Contaminated Sites Act 2003*, Western Australia.
5. Department of Defence, June 2021, *Contamination Management Manual*
6. Department of Defence, November 2021, October 2022, *PFAS OMP Annual Interpretive Report Guidance*, Version 0.4
7. Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.
8. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement *Technical Guidelines for the Estimation of Emissions by Facilities in Australia.*
9. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
10. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
11. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, *Guidance on Environmental Data Verification and Data Validation*.
12. GSI Environmental, *GSI Mann-Kendall Toolkit for Constituent Trend Analysis*, Version 1.0, November 2012.
13. The Heads of EPAs Australia and New Zealand (HEPA; 2020) *PFAS National Environmental Management Plan (NEMP) 2.0*, January 2020.
14. National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended), registered May 2013.
15. National Health and Medical Research Council (NHMRC) (2011, as updated 2018) *National Water Quality Management Strategy Australian Drinking Water Guidelines 6*, August 2018
16. NHMRC, August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.
17. Standards Australia/Standards New Zealand (1998) AS5667.1:1998 *Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*.
18. U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process* (EPA QA/G-4).
19. USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation* (EPA QA/G-8).

Site Specific References

20. Cardno, August 2022, Reference: DEF19009, Rev7 *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling* (Appendix B).
21. Cardno, September 2021, *PFAS OMP – 2020 Annual Interpretive Report, HMAS Stirling.*
22. Cardno, May 2021, *PFAS OMP 2020 Q4 Monitoring Factual Report*.
23. Cardno, June 2021, *PFAS OMP Quarterly Sampling Event Factual Report March 2021*.
24. Cardno, August 2021, *PFAS OMP Quarterly Sampling Event Factual Report June 2021*.
25. Cardno, November 2021, *PFAS OMP Quarterly Sampling Event Factual Report September 2021*.
26. Cardno, April 2022, *PFAS OMP Quarterly Sampling Event Factual Report January 2022*.
27. Cardno, August 2022, *PFAS OMP Quarterly Sampling Event Factual Report March 2022*.
28. Cardno, October 2022, *PFAS OMP Quarterly Sampling Event Factual Report June 2022*.
29. Cardno, December 2022, *PFAS OMP Quarterly Sampling Event Factual Report September 2022*.
30. Cardno, May 2023, *PFAS OMP* DRAFT *2021 Annual Interpretive Report, HMAS Stirling*.
31. Department of Defence, January 2019, *HMAS Stirling Garden Island PFAS Management Area Plan*.
32. GHD, October 2019, *Stage 1 Preliminary Site Investigation*.
33. GHD, June 2020, *Stage 2 RCIP DSI (Mobilisation 1)*.

34. GHD, 2020, *Stage 2 RCIP DSI Mobilisation Report June 2020 – PFAS Summary*.
35. Greencap, November 2019, *DSI B0086 Diamantina Pier Car Park, HMAS Stirling*.
36. RPS, May 2018, *Detailed Site Investigation – HMAS Stirling PFAS Investigation*, Ref. EEC16094.003 (RPS, 2018a).
37. RPS, September 2018, *Ecological Risk Assessment - HMAS Stirling PFAS Investigation*, Ref. EEC16094.009 (RPS, 2018b).
38. RPS, October 2018, *Ongoing Monitoring Plan, HMAS Stirling – PFAS*, Ref. EEC16094.005 (RPS, 2018c).

APPENDIX

A

FIGURES

Cardno

now

Stantec



FIGURE 1

1:32,000 Scale at A3

Metres

0 500 1,000

Site Location

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-12-07 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: 304700525_WA_0089-GS-001_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 2

1:32,000 Scale at A3

Metres

0 500 1,000

Management Area

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2022-12-07 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: 304700525_WA_0089-GS-002_ManagementArea 02.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 3A

1:32,000 Scale at A3

Metres

0 500 1,000

Monitoring Locations

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-02 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_MonitoringLocations 03.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 3B

1:750 Scale at A3

Metres

0 25 50

Monitoring Locations

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

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Map Produced by Cardno WA
Date: 2023-02-02 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_DemolitionGroundLocations 03.mxd
Aerial Imagery Supplied by Nearmap



FIGURE 3C

1:2,000 Scale at A3

Metres

0 50 100

Monitoring Locations

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map Produced by Cardno WA
Date: 2023-02-02 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003C_FireTrainingAreaLocations 03.mxd
Aerial Imagery Supplied by Nearmap

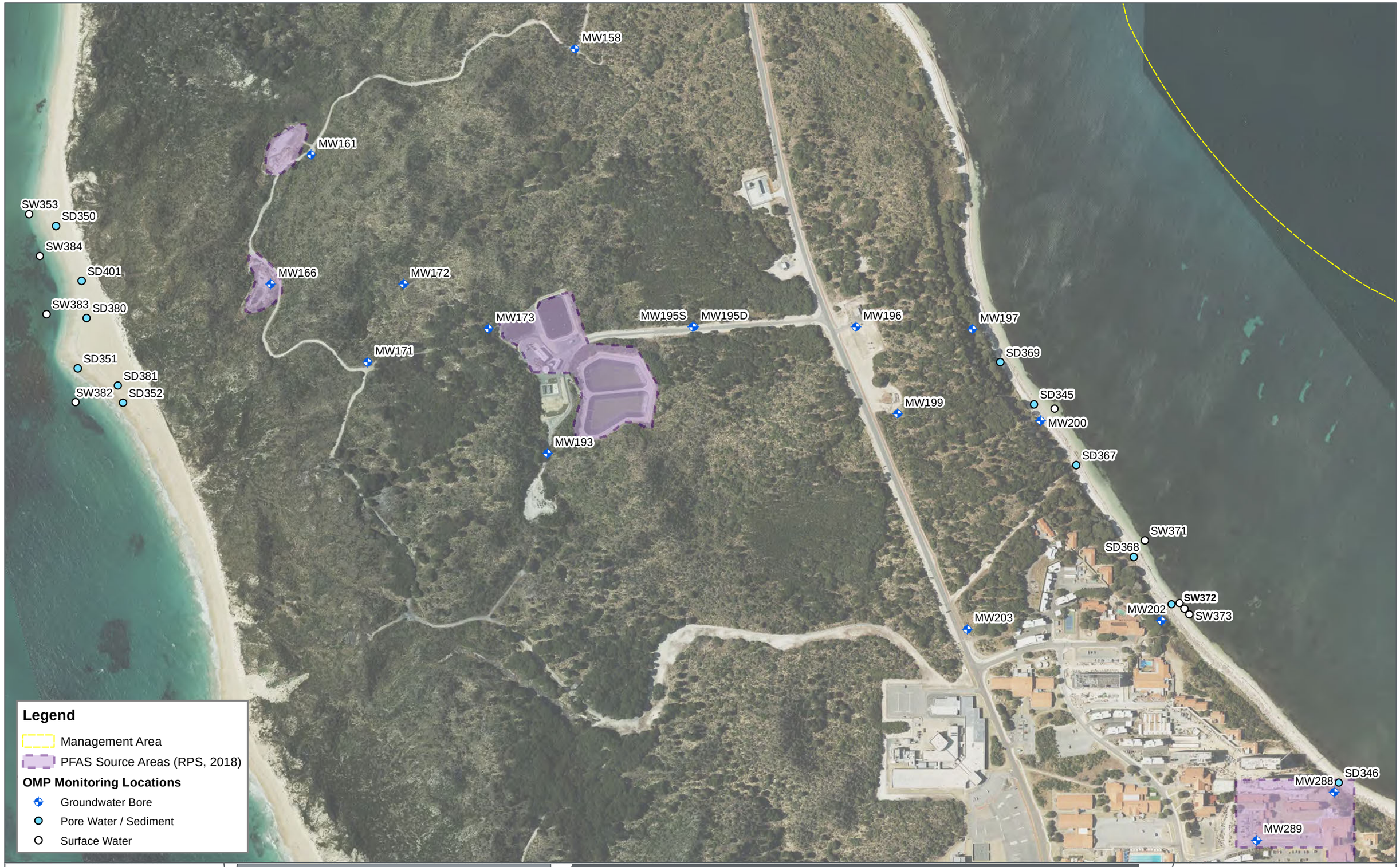

FIGURE 3D

1:5,500 Scale at A3

Metres

0 100 200

Monitoring Locations

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map Produced by Cardno WA
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Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003D_WWTPLocations 03.mxd
Aerial Imagery Supplied by Nearmap



FIGURE 3E

1:3,900 Scale at A3

Metres

0 100 200

Monitoring Locations

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Date: 2023-02-02 | Project: DEF19009
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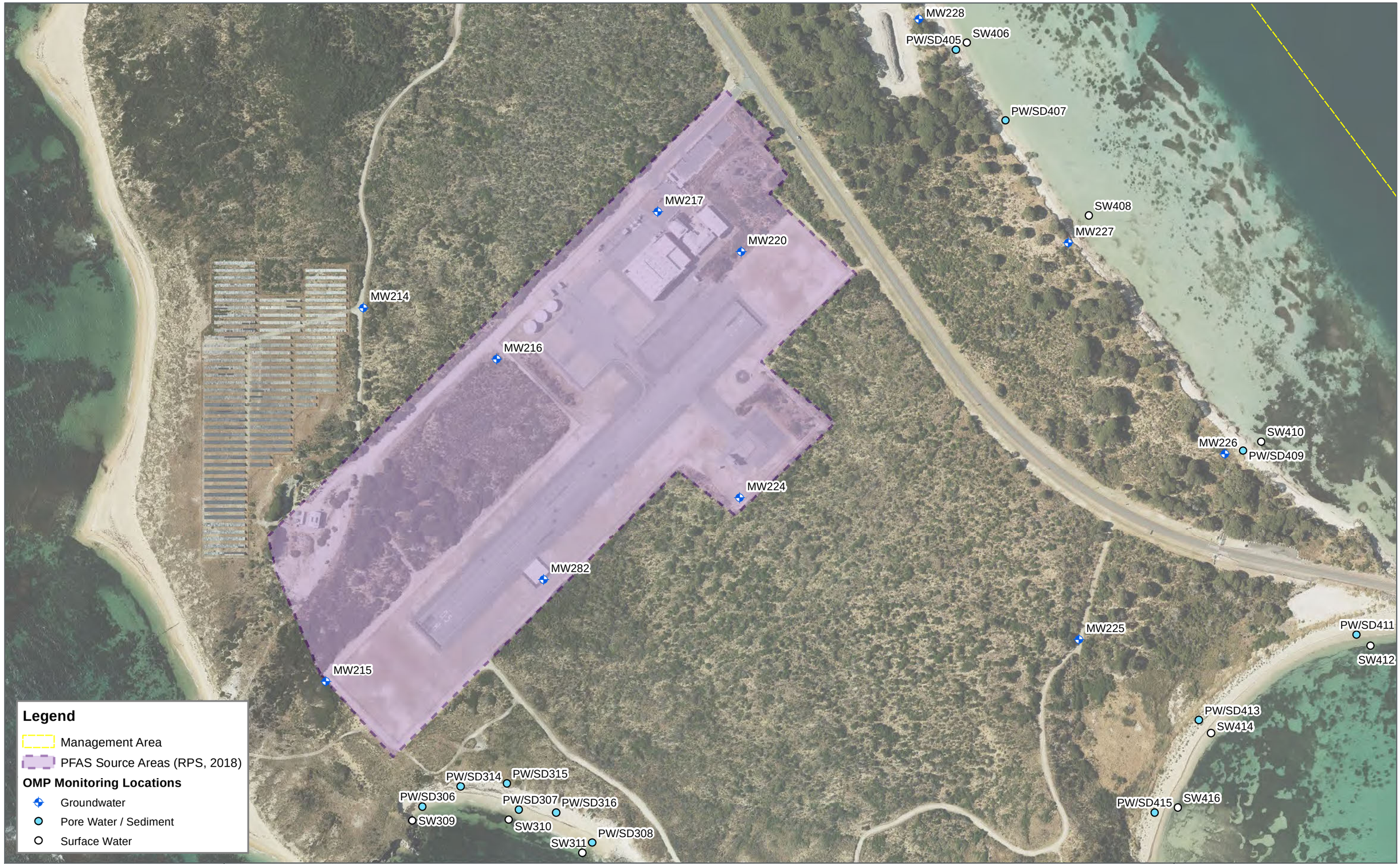

FIGURE 3F

1:3,500 Scale at A3

Metres

0 100 200

Monitoring Locations

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-02 | Project: DEF19009
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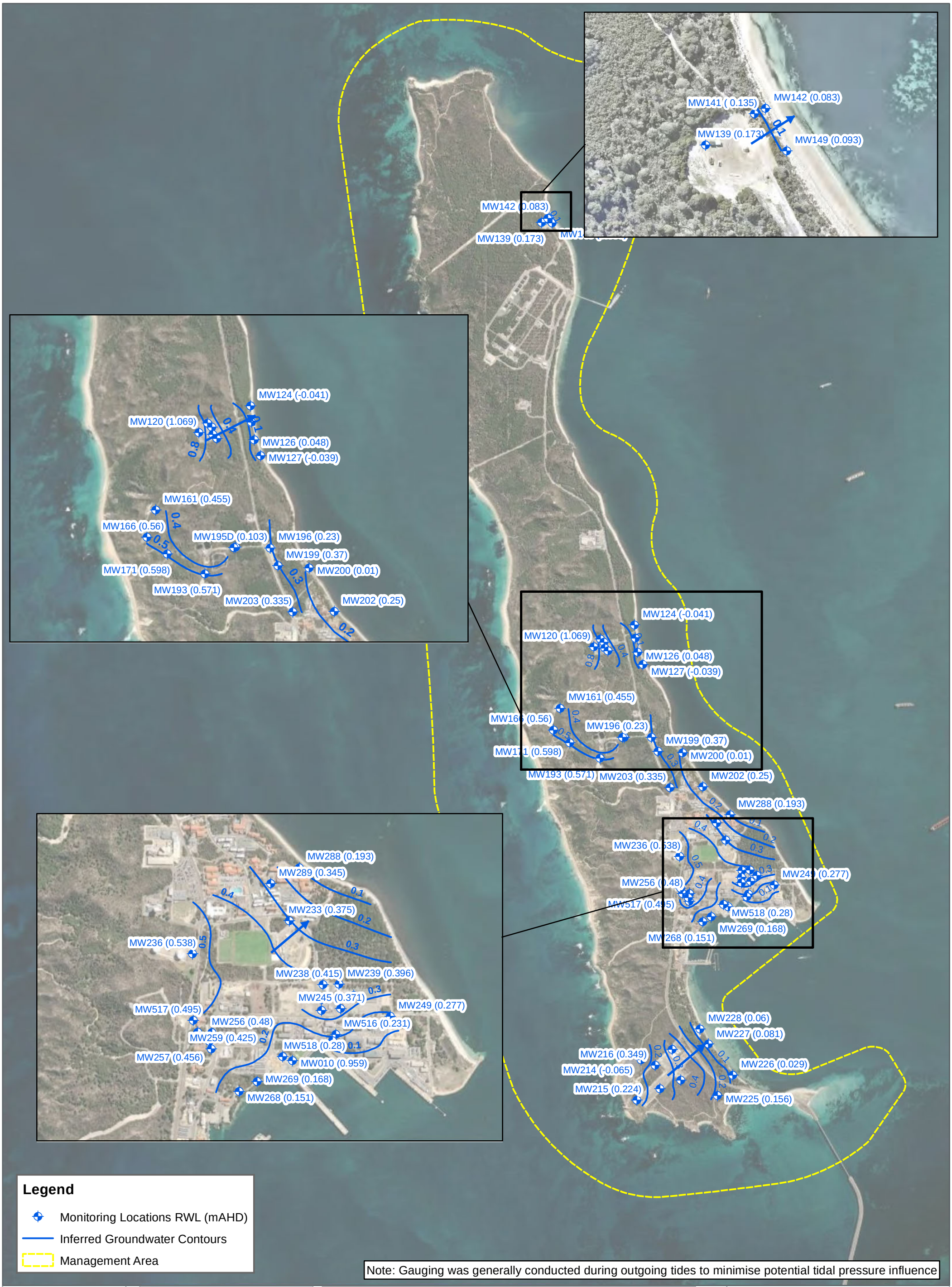
Aerial Imagery Supplied by Nearmap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MW149 (0.093)
MW124 (-0.041)
MW120 (1.069)
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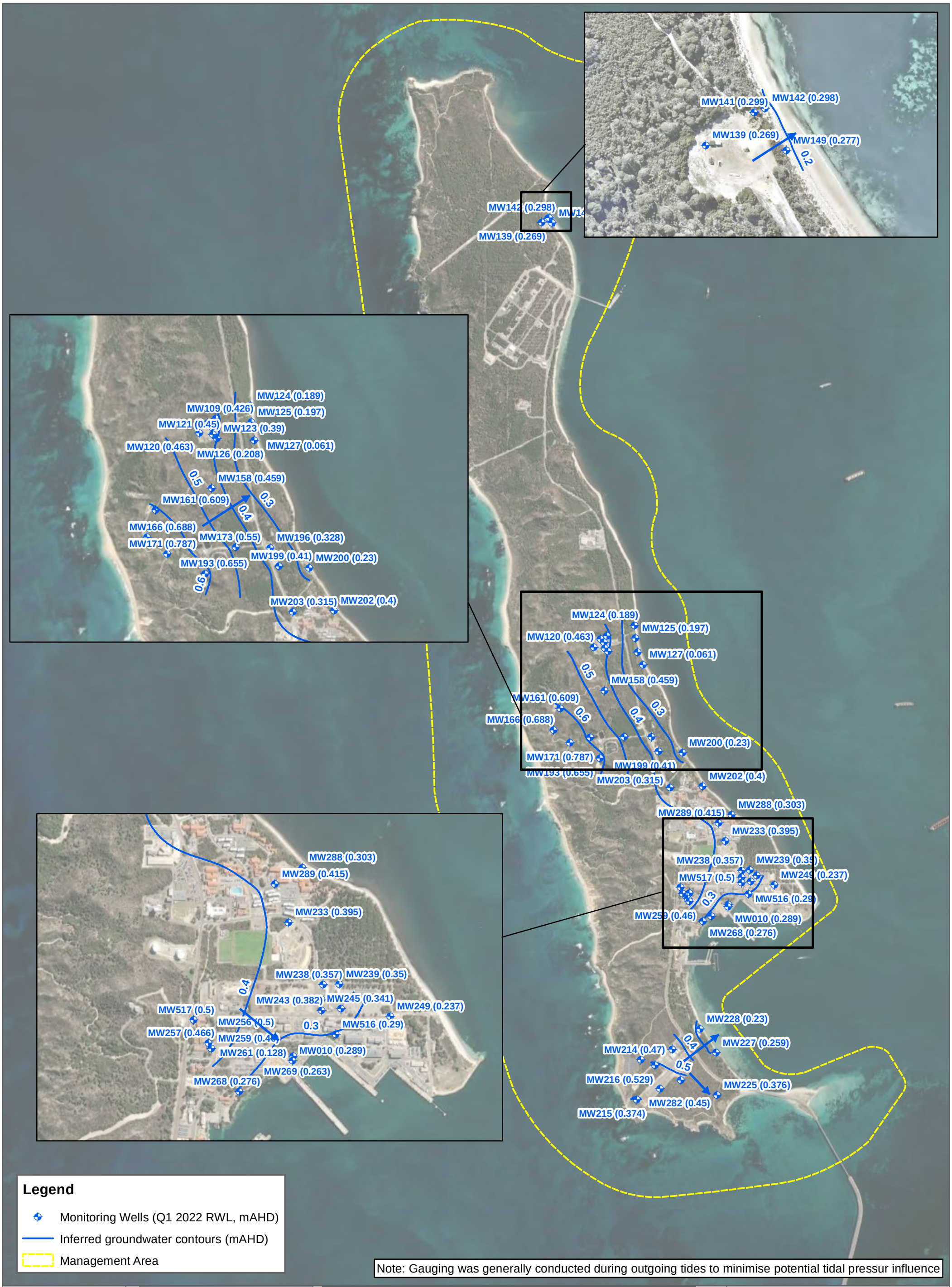
MW127 (-0.039)
MW161 (0.455)
MW166 (0.56)
MW195D (0.103)
MW196 (0.23)
MW199 (0.37)
MW171 (0.598)
MW200 (0.01)
MW193 (0.571)
MW203 (0.335)
MW202 (0.25)
MW288 (0.193)
MW289 (0.345)
MW233 (0.375)
MW236 (0.538)
MW238 (0.415)
MW239 (0.396)
MW245 (0.371)
MW249 (0.277)
MW517 (0.495)
MW256 (0.48)
MW259 (0.425)
MW516 (0.231)
MW518 (0.28)
MW257 (0.456)
MW010 (0.959)
MW269 (0.168)
MW268 (0.151)
MW236 (0.538)
MW256 (0.48)
MW517 (0.495)
MW518 (0.28)
MW269 (0.168)
MW268 (0.151)
MW228 (0.06)
MW227 (0.081)
MW216 (0.349)
MW214 (-0.065)
MW215 (0.224)
MW226 (0.029)
MW225 (0.156)
Legend
Monitoring Locations RWL (mAHD)
Inferred Groundwater Contours
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence
FIGURE 4
1:32,000 Scale at A3
Meters
0
500
1,000
Jan-22 Inferred Groundwater Contours
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-12-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004_2021Q4_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


MW141 (0.299)
MW142 (0.298)
MW139 (0.269)
MW149 (0.277)
0.2
MW142 (0.298)
MW139 (0.269)
MW124 (0.189)
MW109 (0.426)
MW125 (0.197)
MW121 (0.45)
MW123 (0.39)
MW120 (0.463)
MW127 (0.061)
MW126 (0.208)
MW158 (0.459)
0.5
0.3
MW161 (0.609)
0.4
MW166 (0.688)
MW173 (0.55)
MW196 (0.328)
MW171 (0.787)
MW199 (0.41)
MW200 (0.23)
MW193 (0.655)
0.6
MW203 (0.315)
MW202 (0.4)
MW124 (0.189)
MW125 (0.197)
MW120 (0.463)
MW127 (0.061)
0.5
MW158 (0.459)
MW161 (0.609)
0.6
0.4
0.3
MW166 (0.688)
MW200 (0.23)
MW171 (0.787)
MW199 (0.41)
MW193 (0.655)
MW203 (0.315)
MW202 (0.4)
MW288 (0.303)
MW289 (0.415)
MW233 (0.395)
MW238 (0.357)
MW239 (0.35)
MW517 (0.5)
MW249 (0.237)
0.2
MW516 (0.29)
MW259 (0.46)
MW010 (0.289)
MW268 (0.276)
MW288 (0.303)
MW289 (0.415)
MW233 (0.395)
MW238 (0.357)
MW239 (0.35)
0.4
MW243 (0.382)
MW245 (0.341)
MW249 (0.237)
MW517 (0.5)
MW256 (0.5)
0.3
MW516 (0.29)
MW257 (0.466)
MW259 (0.46)
MW261 (0.128)
MW010 (0.289)
MW269 (0.263)
MW268 (0.276)
MW228 (0.23)
MW227 (0.259)
0.4
MW214 (0.47)
0.5
MW216 (0.529)
MW225 (0.376)
MW282 (0.45)
MW215 (0.374)
Legend
Monitoring Wells (Q1 2022 RWL, mAHD)
Inferred groundwater contours (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressur influence
FIGURE 5
1:32,000 Scale at A3
Meters
0
500
1,000
Mar-22 Inferred Groundwater Contours
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-07-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2022Q1_GroundwaterContours 01.mxd
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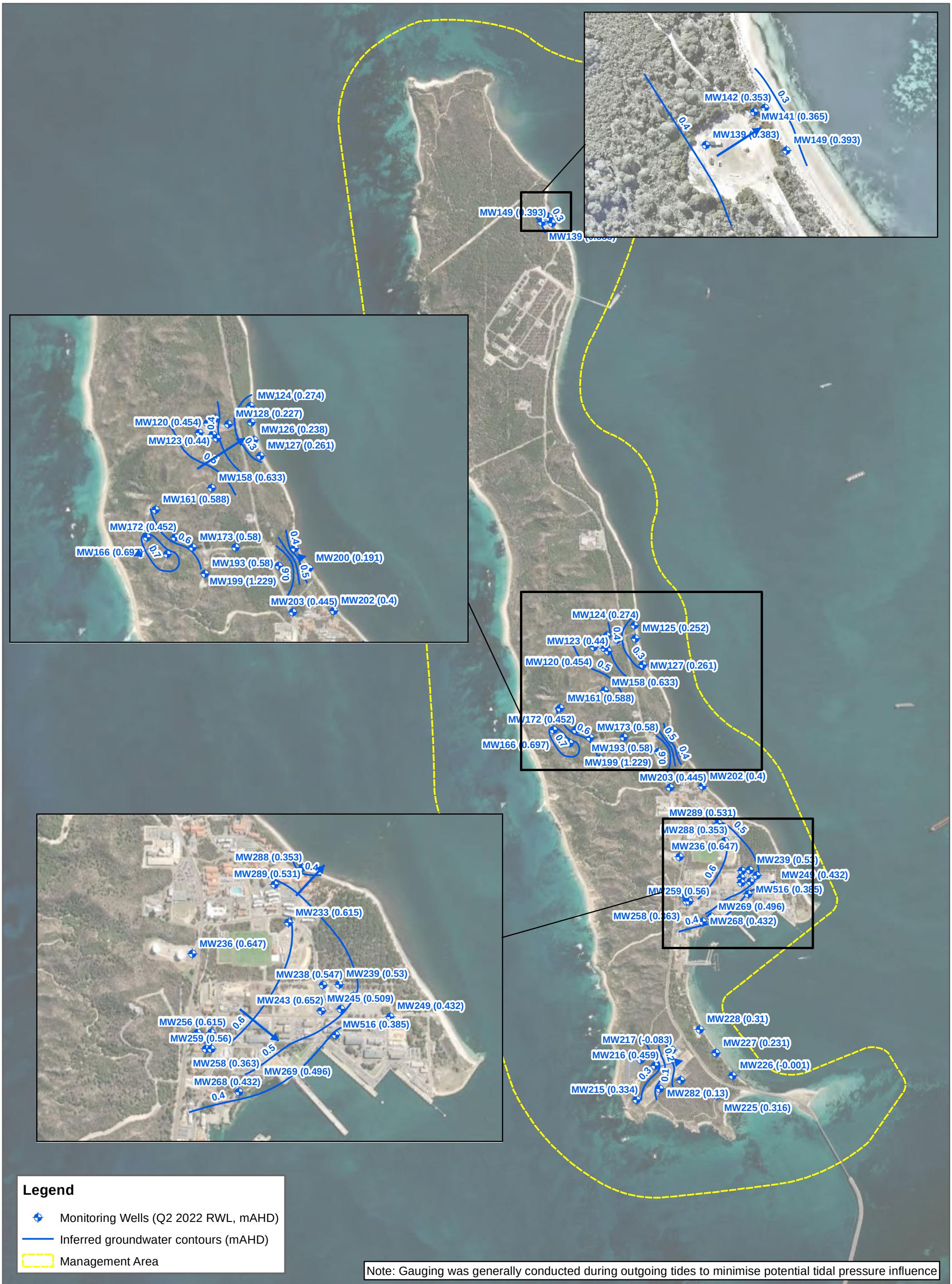
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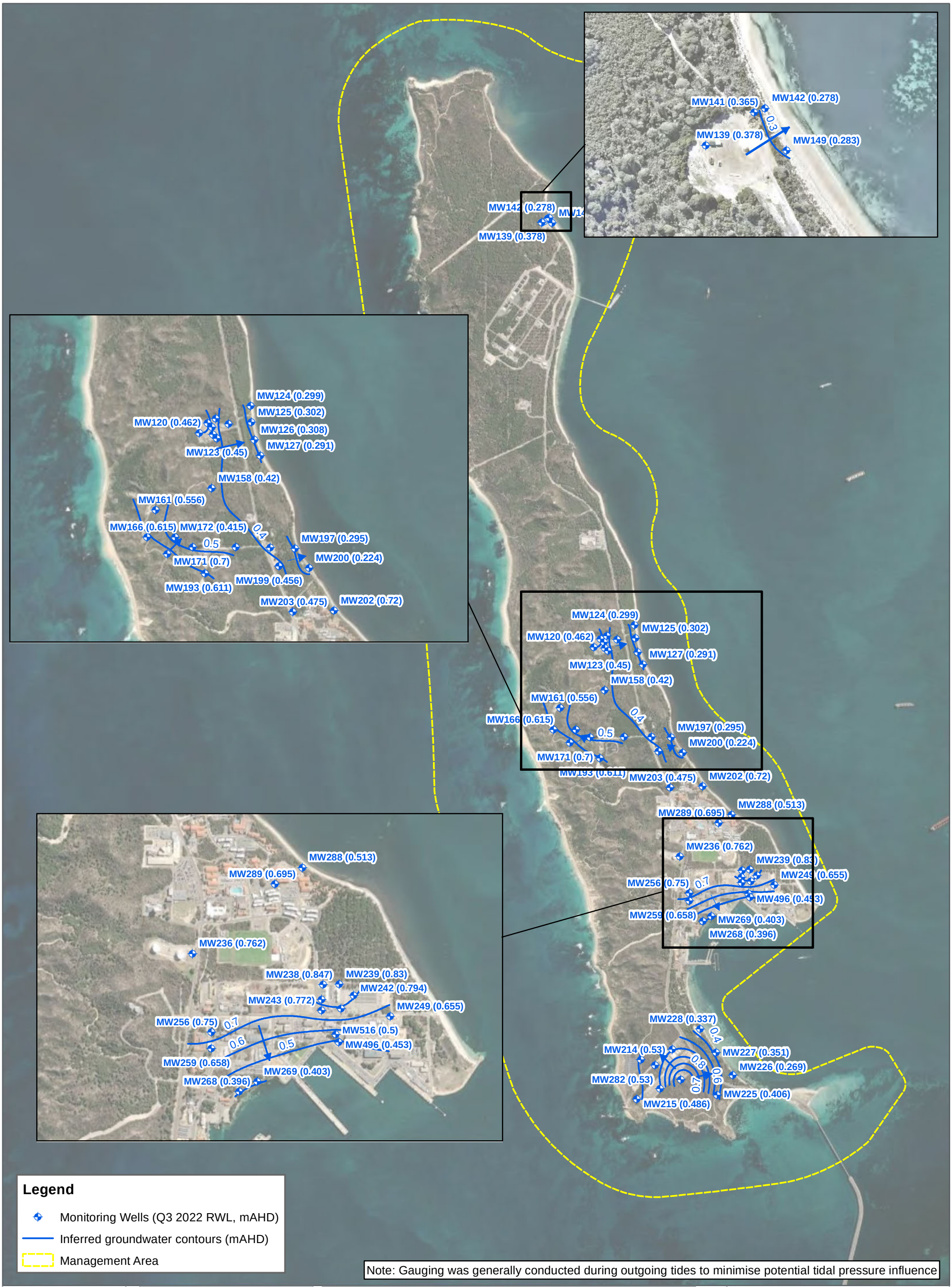
MW141 (0.365)
MW139 (0.383)
MW149 (0.393)
0.3
0.4
MW149 (0.393)
0.3
MW124 (0.274)
MW128 (0.227)
MW120 (0.454)
MW126 (0.238)
MW123 (0.44)
MW127 (0.261)
0.4
0.3
0.5
MW158 (0.633)
MW161 (0.588)
MW172 (0.452)
0.6
MW173 (0.58)
MW166 (0.697)
0.1
MW193 (0.58)
MW200 (0.191)
0.9
0.5
MW199 (1.229)
MW203 (0.445)
MW202 (0.4)
MW124 (0.274)
MW125 (0.252)
MW123 (0.44)
0.4
0.1
0.3
MW120 (0.454)
0.5
MW127 (0.261)
MW158 (0.633)
MW161 (0.588)
MW172 (0.452)
0.6
MW173 (0.58)
0.5
MW166 (0.697)
0.7
MW193 (0.58)
0.4
0.9
MW199 (1.229)
MW203 (0.445)
MW202 (0.4)
MW289 (0.531)
MW288 (0.353)
0.5
MW236 (0.647)
MW239 (0.53)
0.6
MW249 (0.432)
MW259 (0.56)
MW516 (0.385)
MW269 (0.496)
MW258 (0.363)
0.4
MW268 (0.432)
MW288 (0.353)
0.4
MW289 (0.531)
MW233 (0.615)
MW236 (0.647)
MW238 (0.547)
MW239 (0.53)
MW243 (0.652)
MW245 (0.509)
MW249 (0.432)
MW256 (0.615)
0.6
MW516 (0.385)
MW259 (0.56)
0.5
MW258 (0.363)
MW269 (0.496)
MW268 (0.432)
0.4
MW228 (0.31)
MW217 (-0.083)
MW227 (0.231)
MW216 (0.459)
0.2
MW226 (-0.001)
0.3
0.1
MW215 (0.334)
MW282 (0.13)
MW225 (0.316)
Legend
Monitoring Wells (Q2 2022 RWL, mAHD)
Inferred groundwater contours (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence
FIGURE 6
1:32,000 Scale at A3
Meters
0
500
1,000
Jun-22 Inferred Groundwater Contours
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-12-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2022Q2_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


MW141 (0.365)
MW142 (0.278)
0.3
MW139 (0.378)
MW149 (0.283)
MW142 (0.278)
MW139 (0.378)
MW124 (0.299)
MW125 (0.302)
MW120 (0.462)
MW126 (0.308)
MW127 (0.291)
MW123 (0.45)
MW158 (0.42)
MW161 (0.556)
MW166 (0.615)
MW172 (0.415)
0.4
0.5
MW197 (0.295)
MW200 (0.224)
MW171 (0.7)
MW199 (0.456)
MW193 (0.611)
MW203 (0.475)
MW202 (0.72)
MW288 (0.513)
MW289 (0.695)
MW236 (0.762)
MW238 (0.847)
MW239 (0.83)
MW242 (0.794)
MW243 (0.772)
MW249 (0.655)
MW256 (0.75)
0.7
MW516 (0.5)
0.6
MW496 (0.453)
MW259 (0.658)
MW269 (0.403)
MW268 (0.396)
MW228 (0.337)
0.4
MW214 (0.53)
MW227 (0.351)
0.8
MW226 (0.269)
MW282 (0.53)
0.6
0.7
MW225 (0.406)
MW215 (0.486)
Legend
Monitoring Wells (Q3 2022 RWL, mAHD)
Inferred groundwater contours (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence
FIGURE 7
1:32,000 Scale at A3
Meters
0
500
1,000
Sept-22 Inferred Groundwater Contours
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
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Cardno
Map Produced by Cardno WA
Date: 2022-12-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-007_2022Q3_GroundwaterContours 01.mxd
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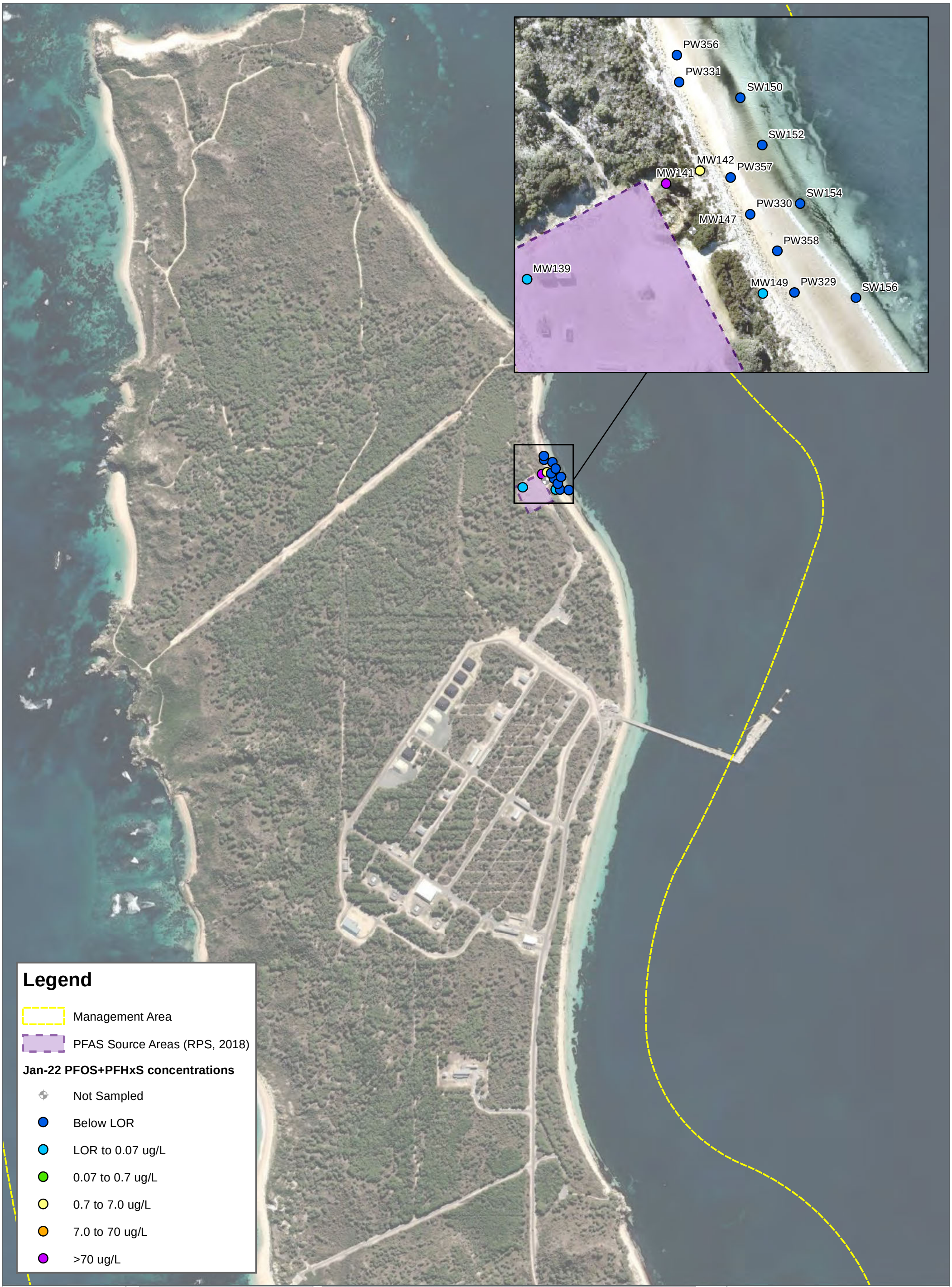

FIGURE 8A

1:10,000 Scale at A3

Metres

0 200 400

PFOS+PFHxS Concentrations - January 2022

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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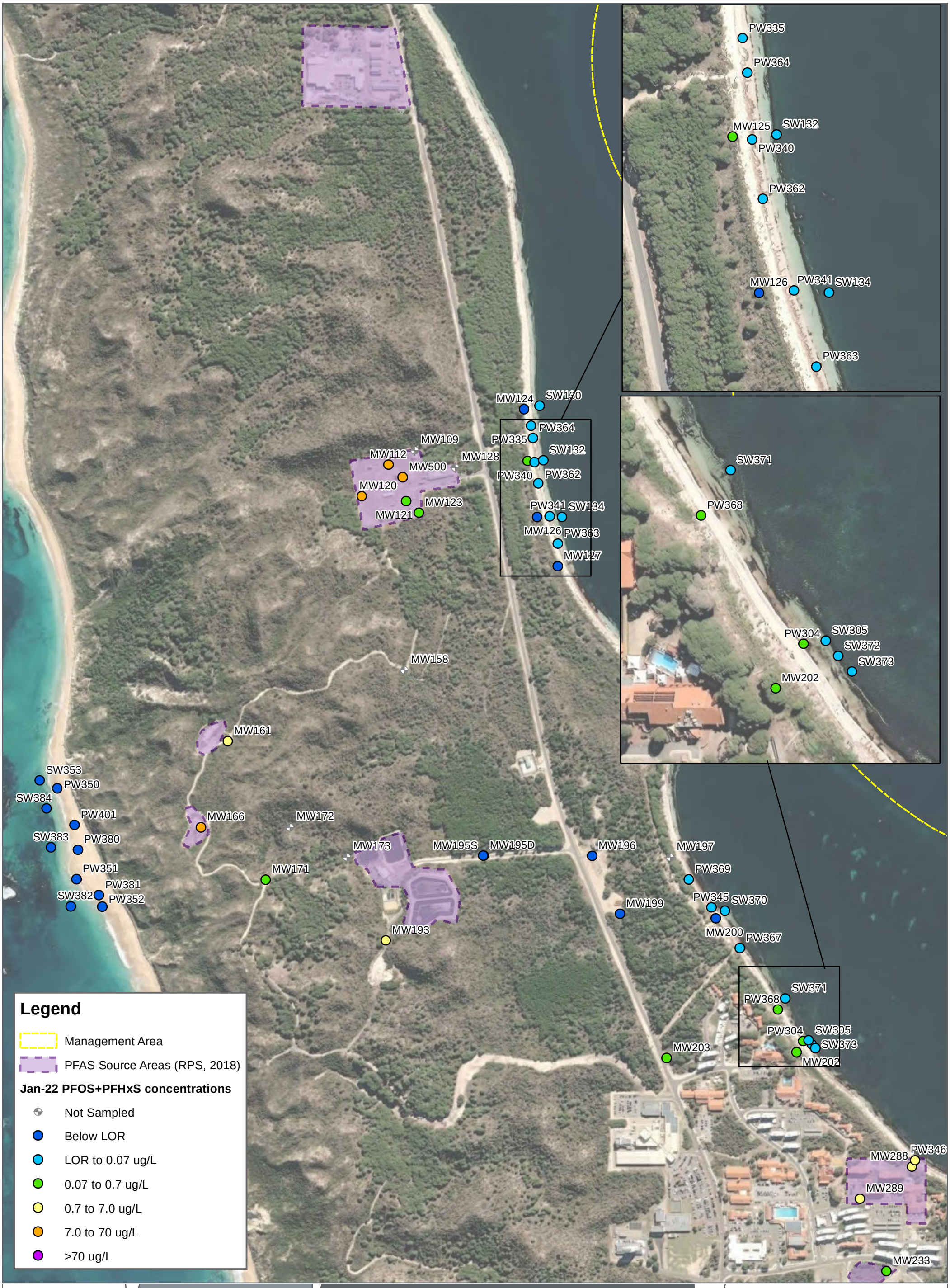

FIGURE 8B

1:8,000 Scale at A3

Metres

0 150 300

PFOS+PFHxS Concentrations - January 2022

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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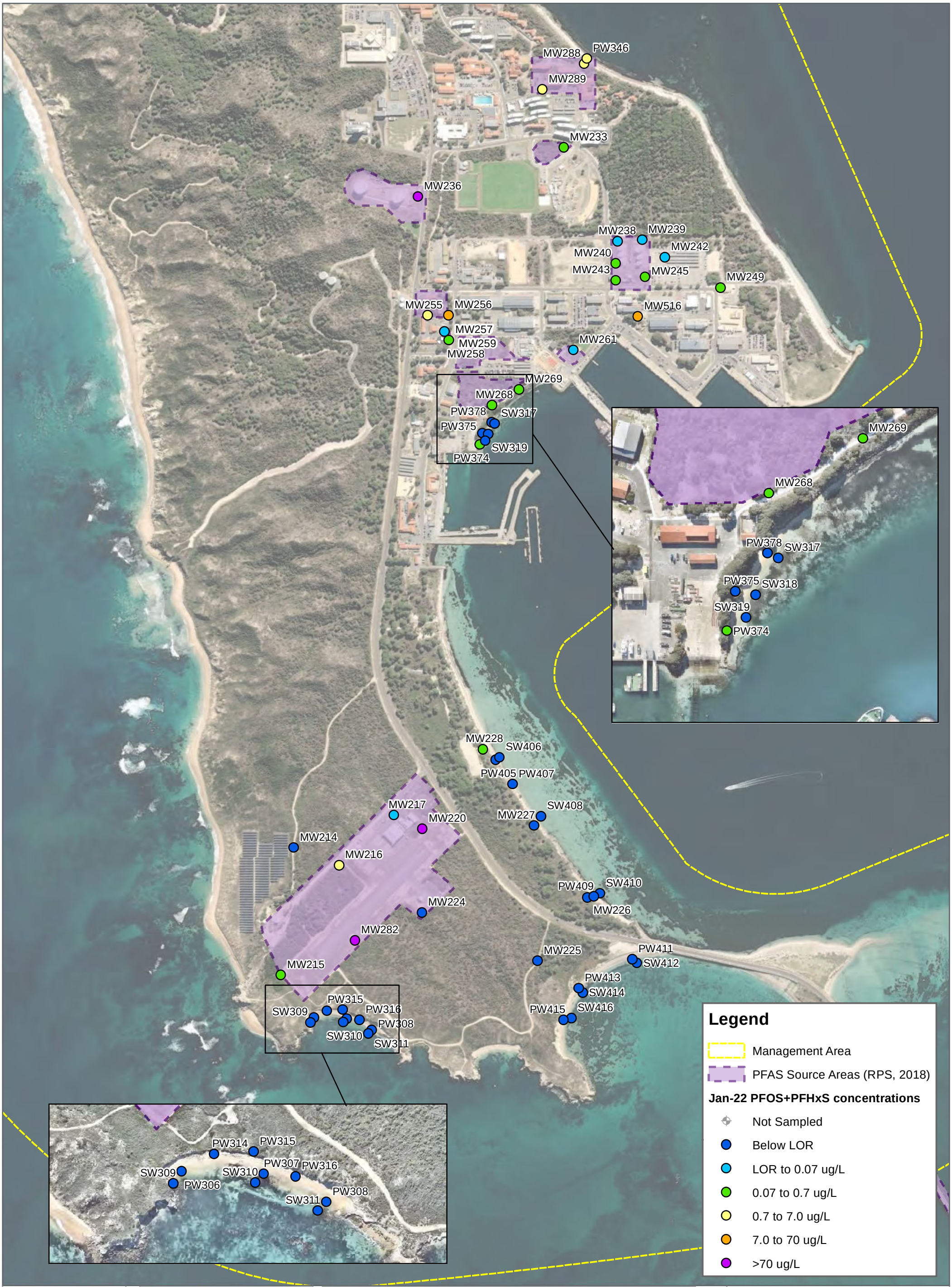
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-008B_PFOS+PFHxS_Jan22 01.mxd
Aerial Imagery Supplied by Google Earth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PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW255
MW256
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MW257
MW259
MW258
MW261
MW269
MW268
PW378
SW317
PW375
SW319
PW374
MW269
MW268
PW378
SW317
PW375
SW318
SW319
PW374
MW228
SW406
PW405
PW407
MW217
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PW413
SW414
PW415
SW416
PW315
SW309
PW316
PW308
SW310
SW311
PW314
PW315
PW307
PW316
SW309
SW310
PW306
PW308
SW311
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Jan-22 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 8C
1:10,000 Scale at A3
Metres
0
200
400
PFOS+PFHxS Concentrations - January 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
Cardno
Map Produced by Cardno WA
Date: 2023-02-13 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-008C_PFOS+PFHxS_Jan22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

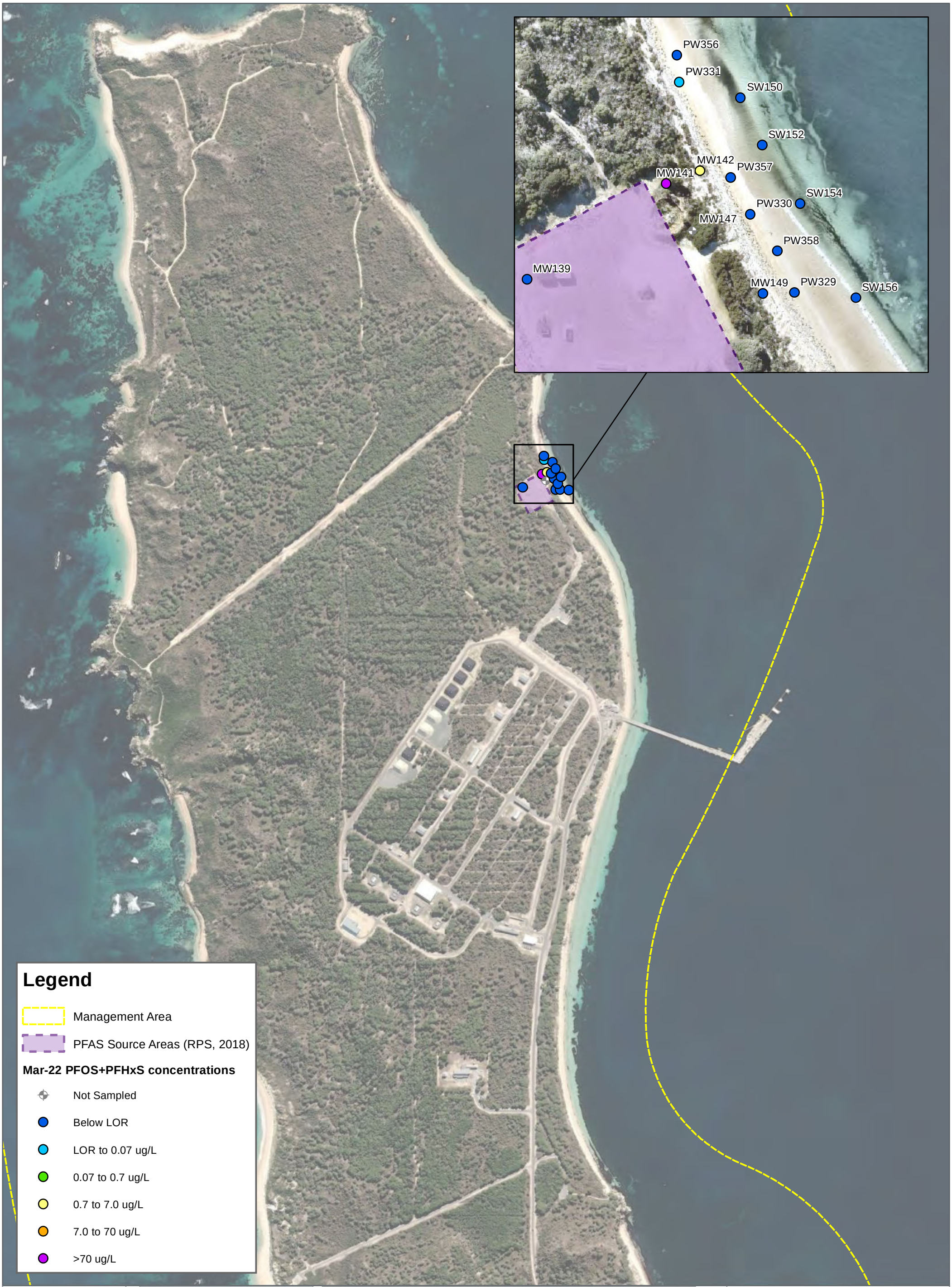

FIGURE 9A

1:10,000 Scale at A3

Metres

0 200 400

PFOS+PFHxS Concentrations - March 2022

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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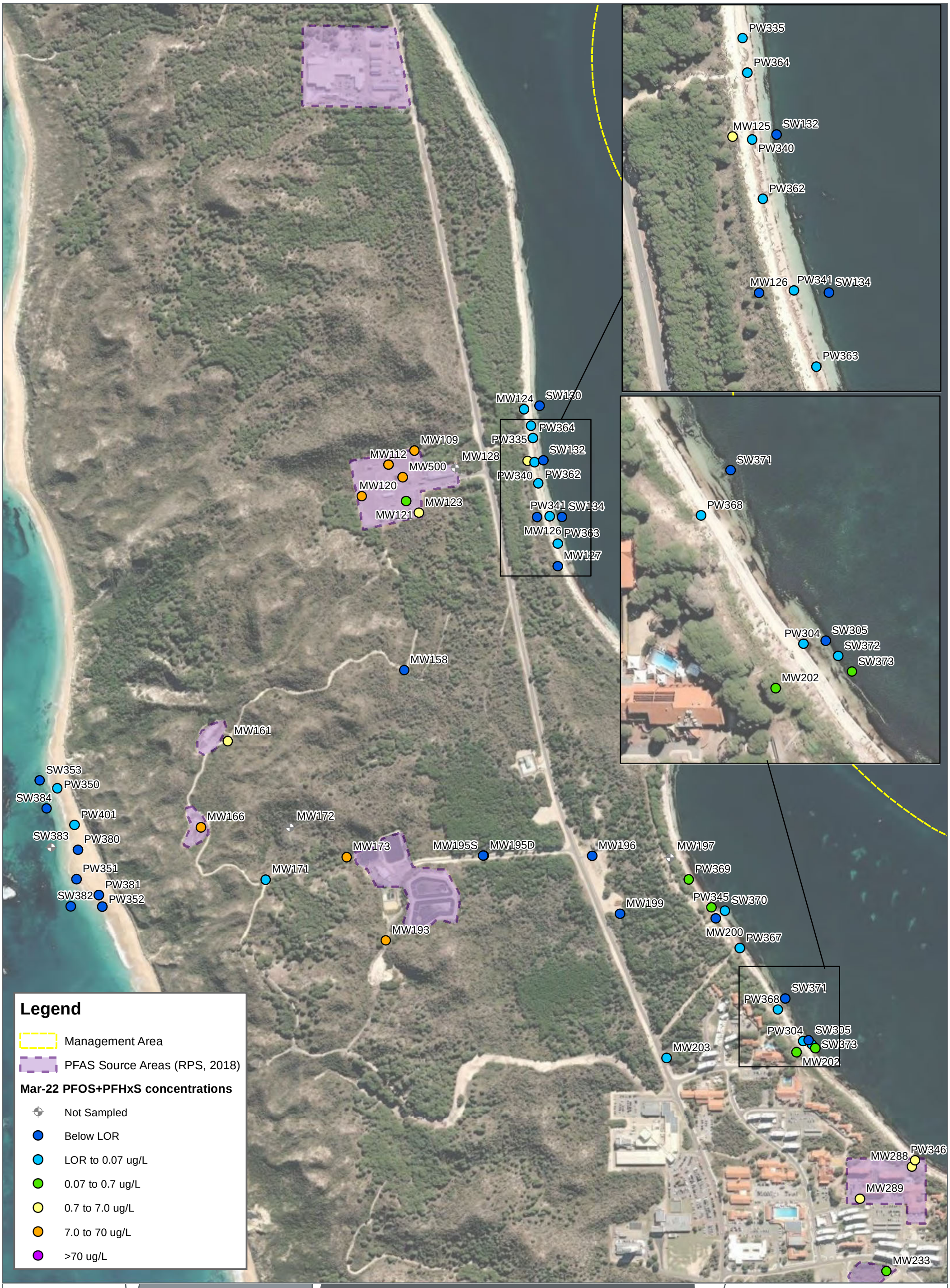
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MW125
SW132
PW340
PW362
MW126
PW341
SW134
PW363
SW371
PW368
PW304
SW305
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SW373
MW202
MW124
SW130
PW364
PW335
SW132
MW109
MW112
MW128
MW500
PW340
PW362
MW120
MW123
MW121
PW341
SW134
MW126
PW363
MW127
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW351
MW171
PW369
PW381
SW382
PW352
MW199
PW345
SW370
MW193
MW200
PW367
SW371
PW368
PW304
SW305
SW373
MW202
MW203
MW288
PW346
MW289
MW233
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Mar-22 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 9B
1:8,000 Scale at A3
Metres
0
150
300
PFOS+PFHxS Concentrations - March 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
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Map: DEF19009_WA_0089-GS-009B_PFOS+PFHxS_Mar22 01.mxd
Aerial Imagery Supplied by Google Earth

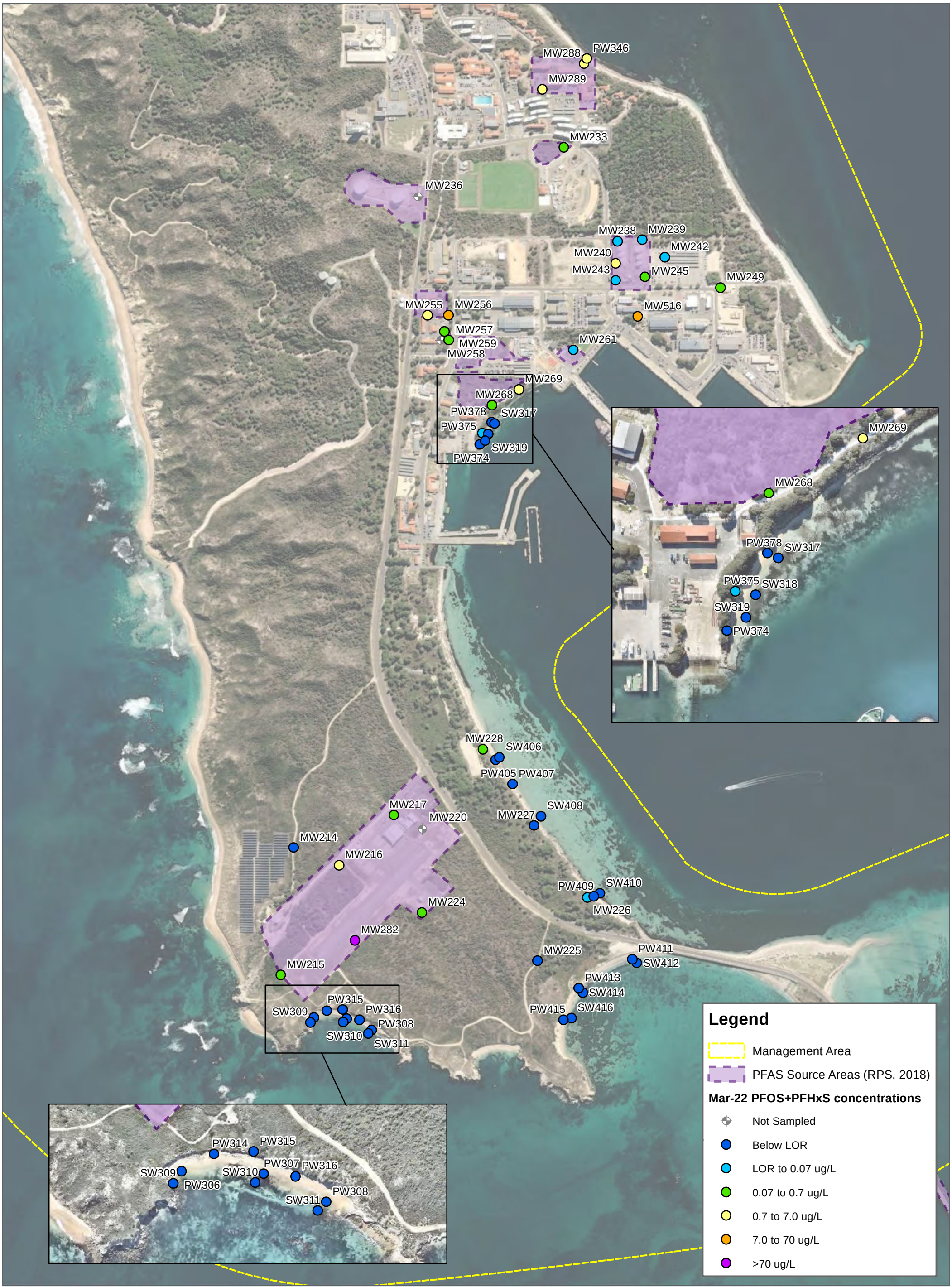

FIGURE 9C

1:10,000 Scale at A3

Metres

0 200 400

PFOS+PFHxS Concentrations - March 2022

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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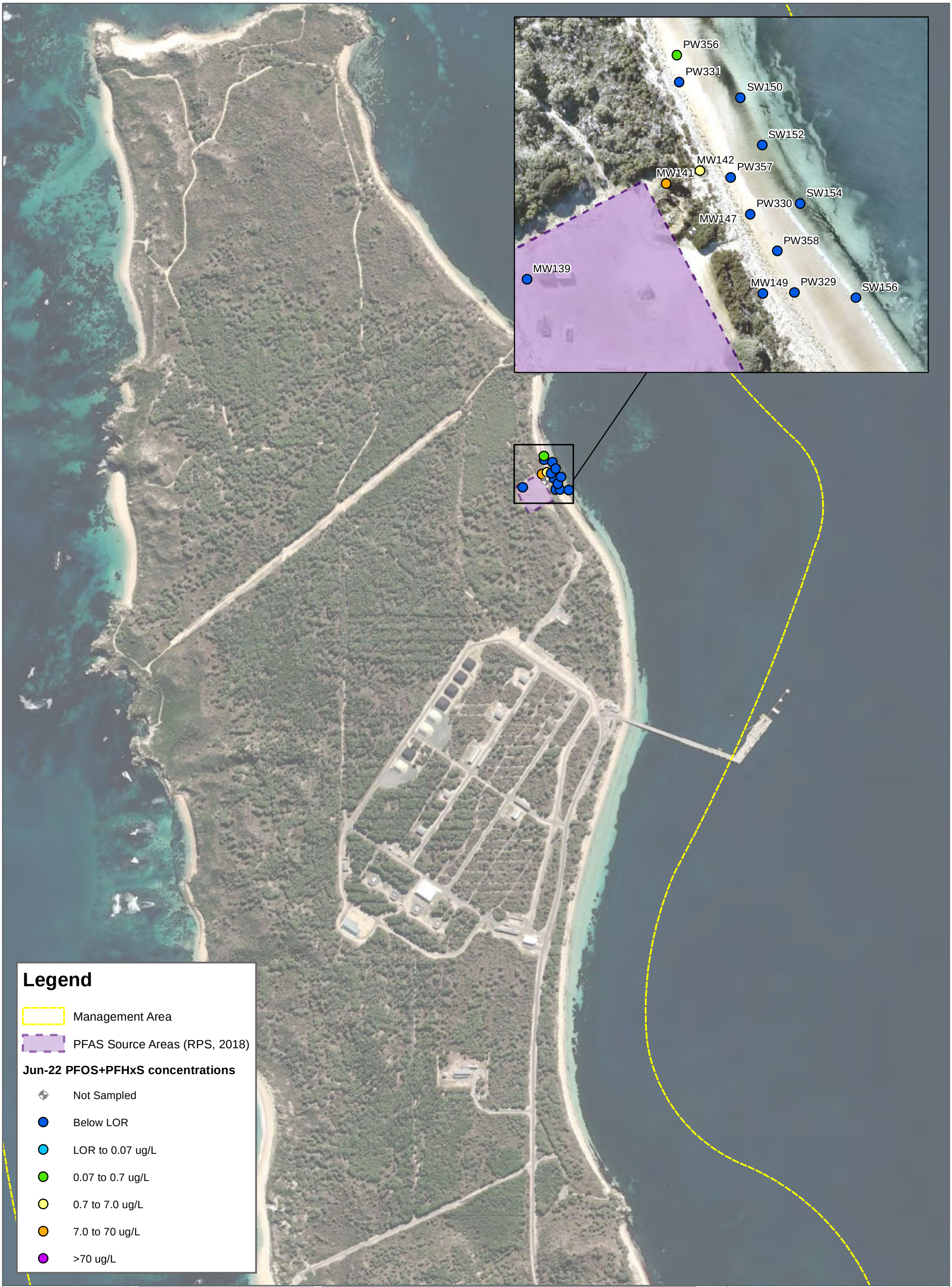

FIGURE 10A

1:10,000 Scale at A3

Metres

0 200 400

PFOS+PFHxS Concentrations - June 2022

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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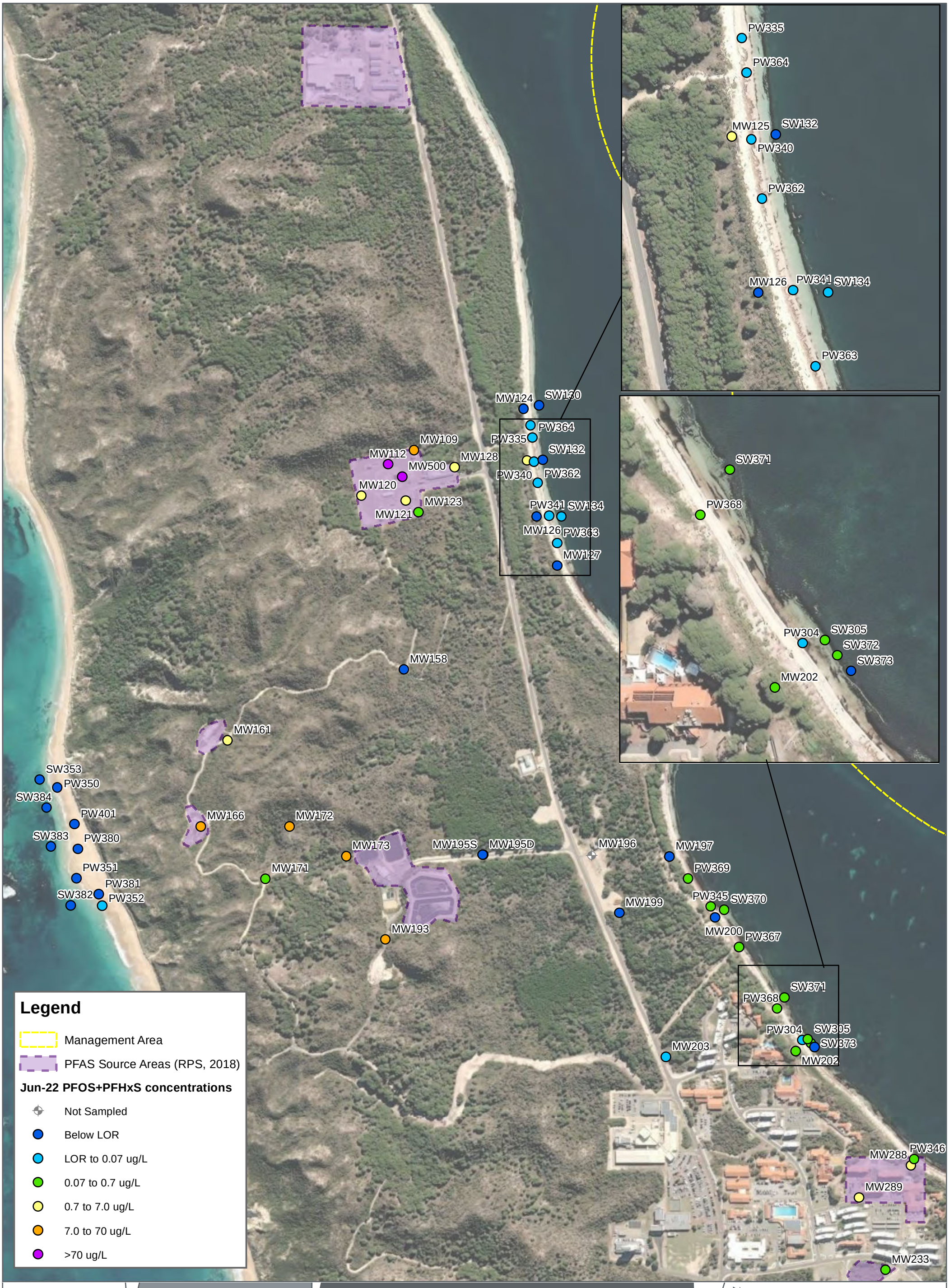
Map: DEF19009_WA_0089-GS-010A_PFOS+PFHxS_Jun22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap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SW132
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PW362
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PW341
SW134
PW363
SW371
PW368
PW304
SW305
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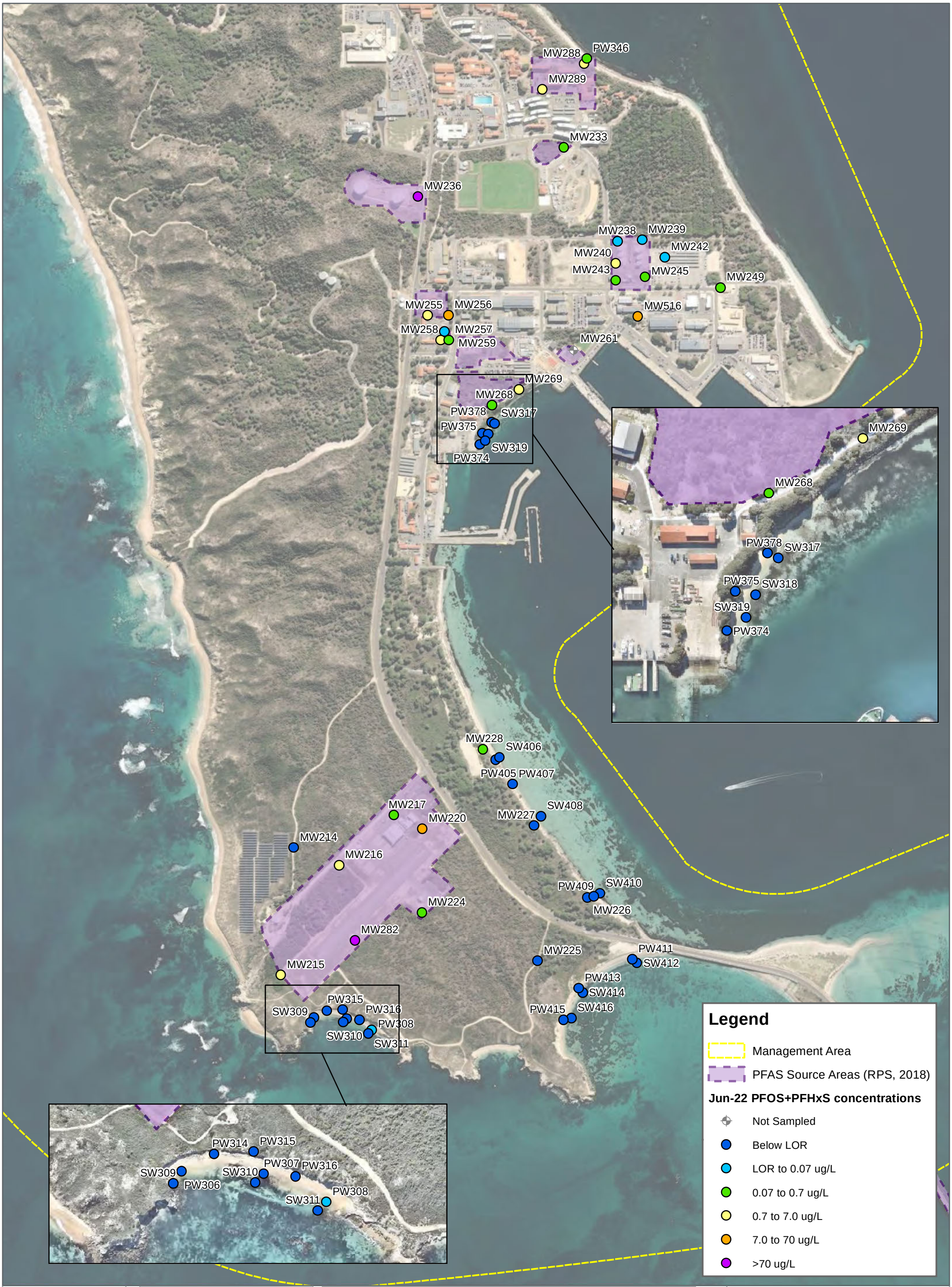
SW373
MW202
MW124
SW130
PW364
PW335
SW132
PW340
PW362
MW109
MW112
MW128
MW500
MW120
MW123
MW121
PW341
SW134
MW126
PW363
MW127
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW351
MW171
PW369
PW381
SW382
PW352
MW199
PW345
SW370
MW200
PW367
SW371
PW368
PW304
SW305
SW373
MW202
MW203
MW288
PW346
MW289
MW233
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Jun-22 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 10B
1:8,000 Scale at A3
Metres
0
150
300
PFOS+PFHxS Concentrations - June 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-02-13 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-010B_PFOS+PFHxS_Jun22 01.mxd
Aerial Imagery Supplied by Google Earth


MW288
PW346
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
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MW249
MW255
MW256
MW516
MW258
MW257
MW259
MW261
MW269
MW268
PW378
SW317
PW375
SW319
PW374
MW269
MW268
PW378
SW317
PW375
SW318
SW319
PW374
MW228
SW406
PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW226
MW224
MW282
MW225
PW411
SW412
MW215
PW413
SW414
PW415
SW416
PW315
SW309
PW316
PW308
SW310
SW311
PW314
PW315
PW307
PW316
SW309
SW310
PW306
PW308
SW311
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Jun-22 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 10C
1:10,000 Scale at A3
Metres
0
200
400
PFOS+PFHxS Concentrations - June 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
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Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-010C_PFOS+PFHxS_Jun22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

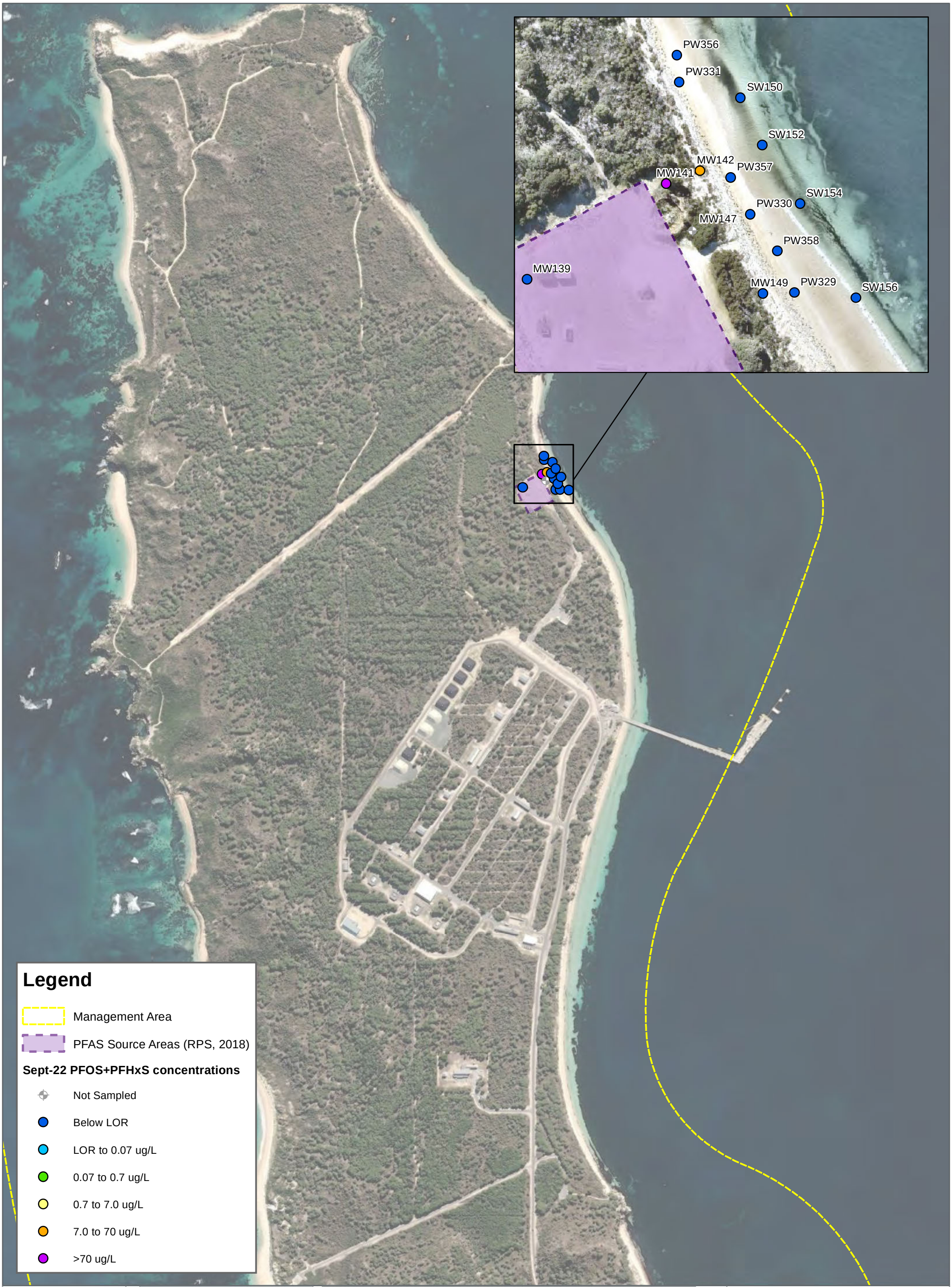

FIGURE 11A

1:10,000 Scale at A3

Metres

0 200 400

PFOS+PFHxS Concentrations - September 2022

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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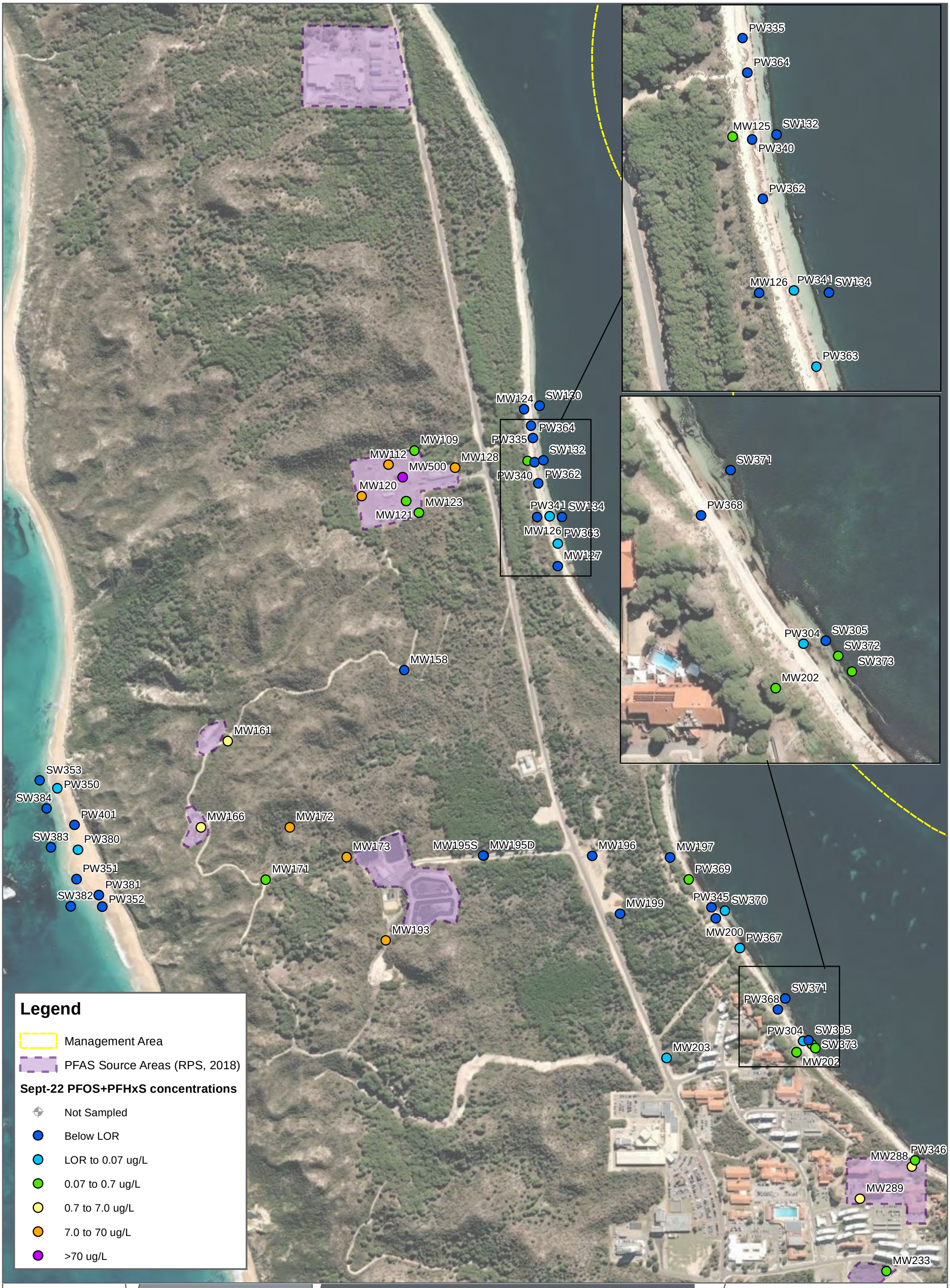
Map: DEF19009_WA_0089-GS-011A_PFOS+PFHxS_Sept22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap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SW132
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MW109
MW112
MW128
MW500
PW340
PW362
MW120
MW123
MW121
PW341
SW134
MW126
PW363
MW127
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
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SW305
SW372
SW373
MW202
MW203
MW288
PW346
MW289
MW233
SW371
PW368
PW304
SW305
SW372
SW373
MW202
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sept-22 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 11B
1:8,000 Scale at A3
Metres
0
150
300
PFOS+PFHxS Concentrations - September 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2023-02-13 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-011B_PFOS+PFHxS_Sept22 01.mxd
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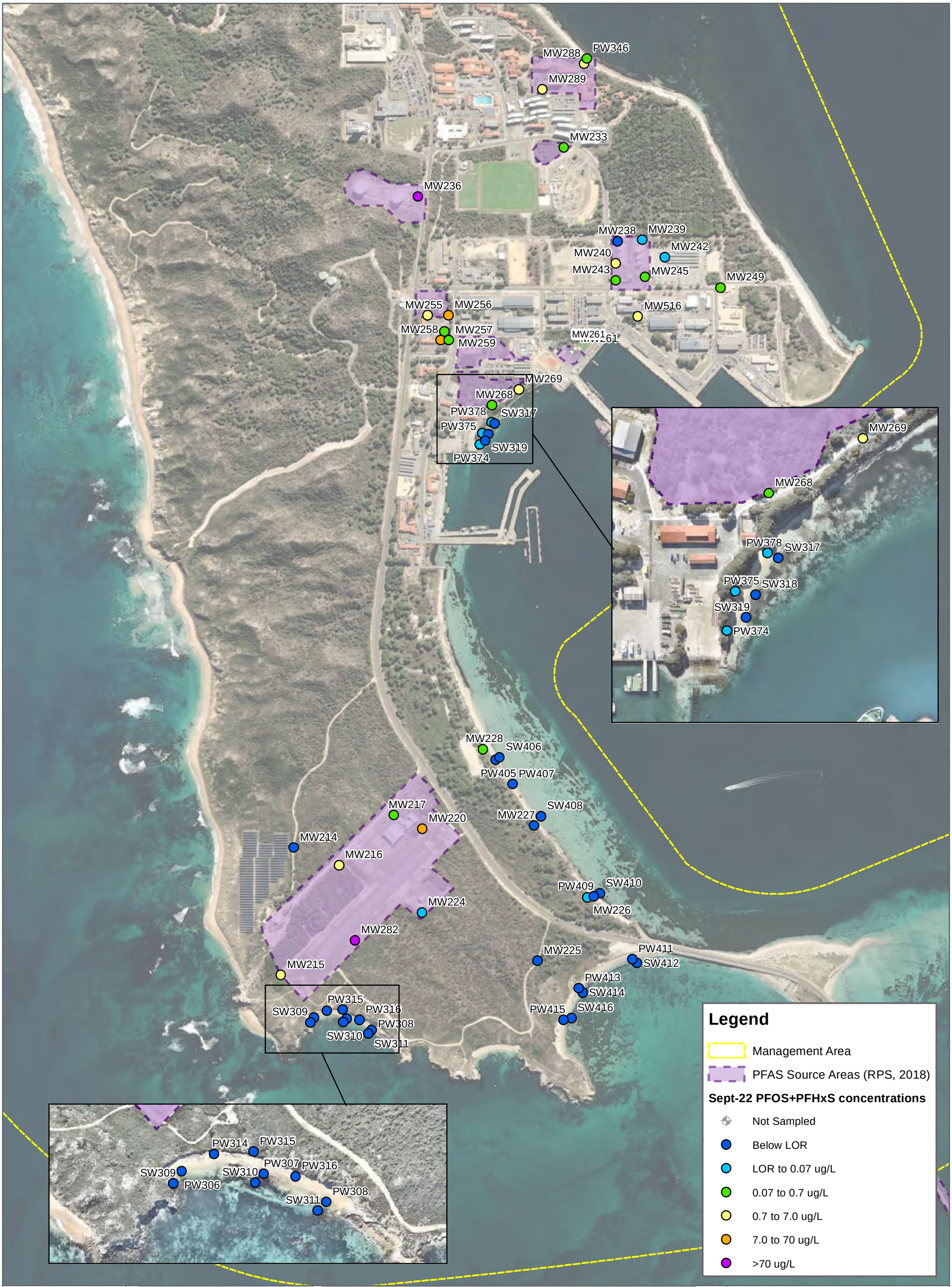
MW288
PW346
MW289
MW233
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MW242
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MW249
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MW261
MW259
MW269
MW268
PW378
SW317
PW375
SW319
PW374
MW269
MW268
PW378
SW317
PW375
SW318
SW319
PW374
MW228
SW406
PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
MW215
PW413
SW414
PW315
SW309
PW316
PW308
SW310
PW415
SW416
SW311
PW314
PW315
PW307
PW316
SW309
SW310
PW306
PW308
SW311
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sept-22 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.07 ug/L
0.07 to 0.7 ug/L
0.7 to 7.0 ug/L
7.0 to 70 ug/L
>70 ug/L
FIGURE 11C
1:10,000 Scale at A3
Metres
0
200
400
PFOS+PFHxS Concentrations - September 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
Cardno
Map Produced by Cardno WA
Date: 2023-02-13 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-011C_PFOS+PFHxS_Sept22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

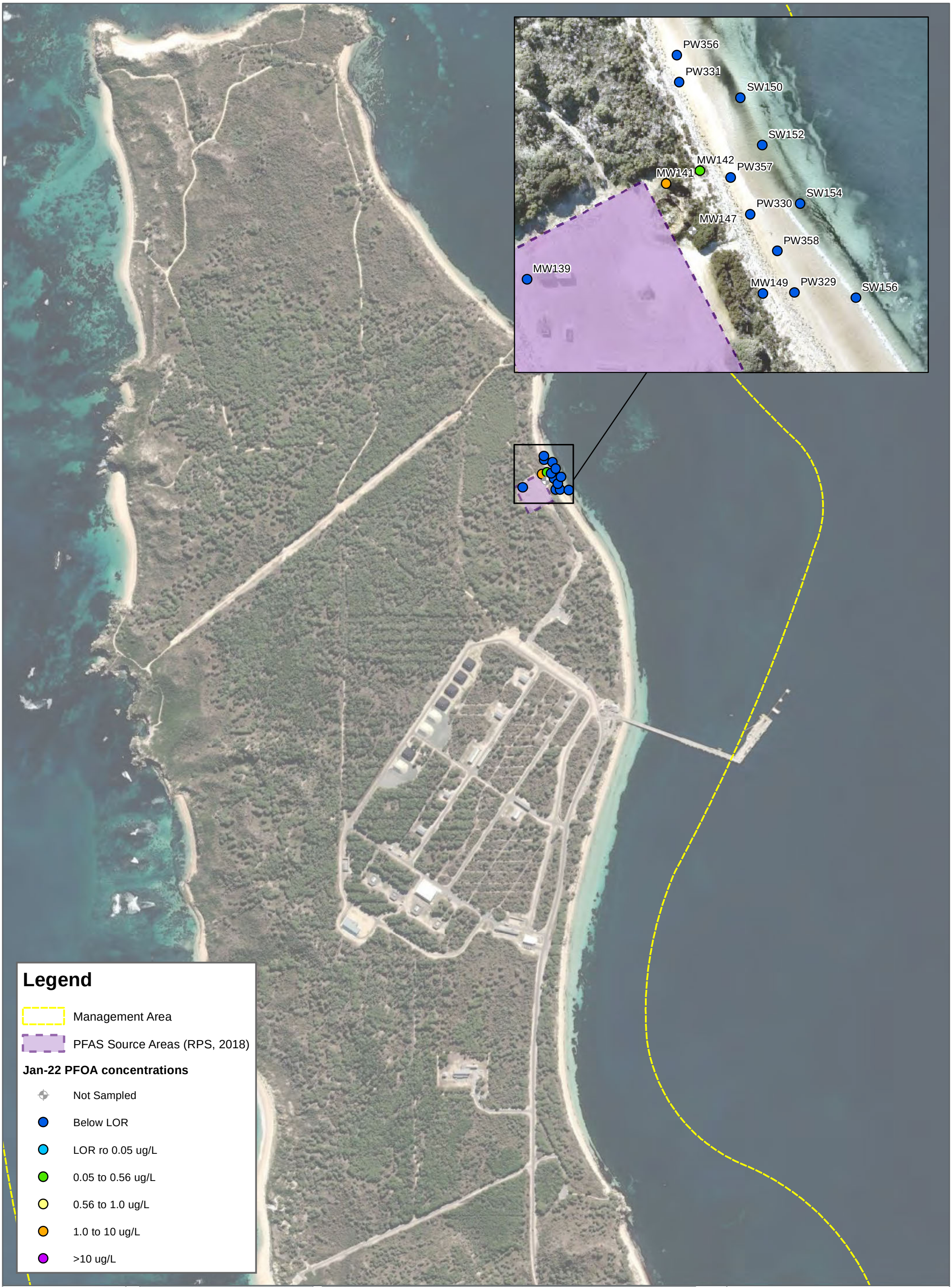

FIGURE 12A

1:10,000 Scale at A3

Metres

0 200 400

PFOA Concentrations - January 2022

2022 ANNUAL INTERPRETIVE REPORT
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DEPARTMENT OF DEFENCE

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Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-012A_PFOA_Jan22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

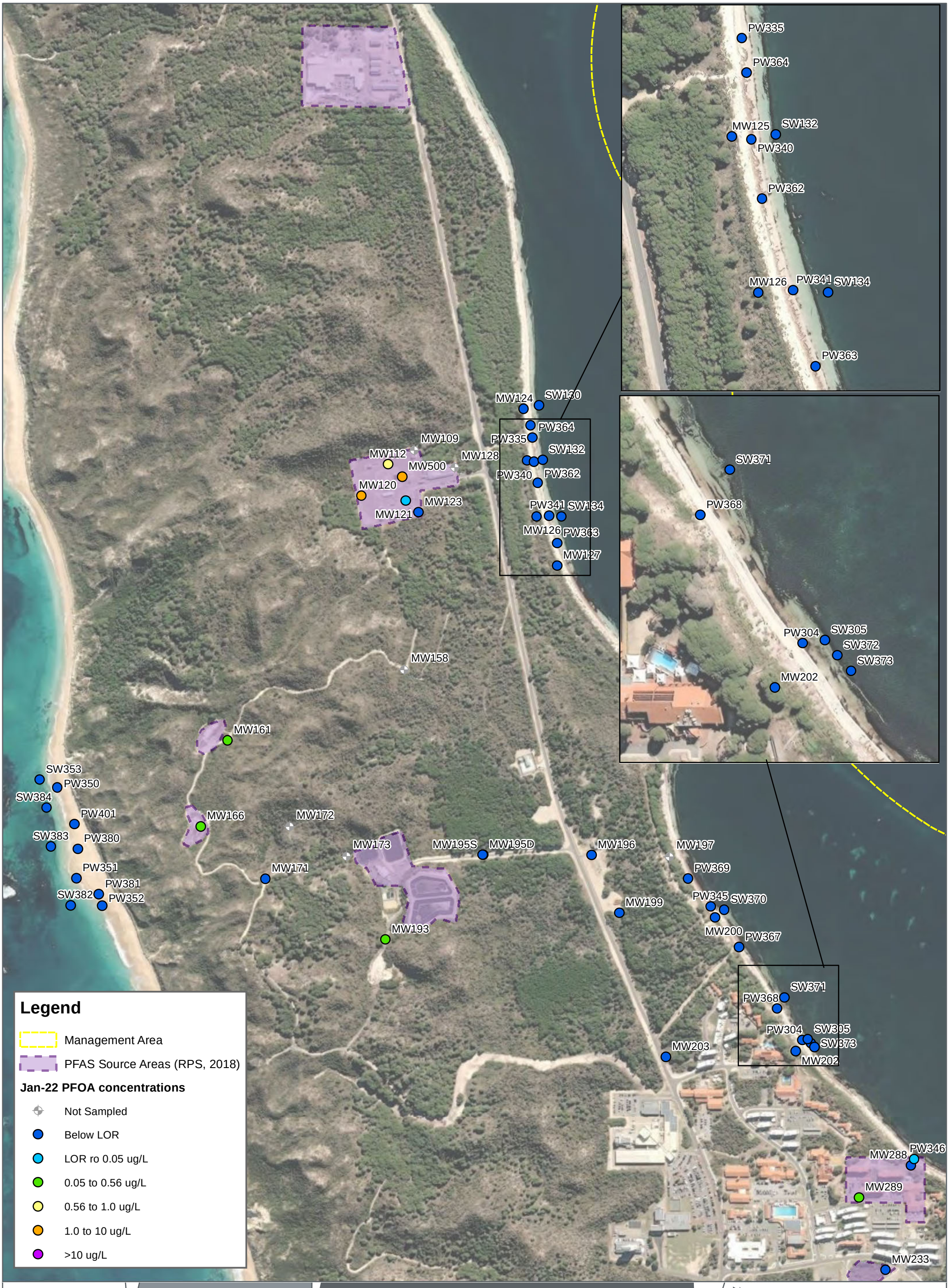

FIGURE 12B

1:8,000 Scale at A3

Metres

0 150 300

PFOA Concentrations - January 2022

2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map: DEF19009_WA_0089-GS-012B_PFOA_Jan22 01.mxd
Aerial Imagery Supplied by Google Earth

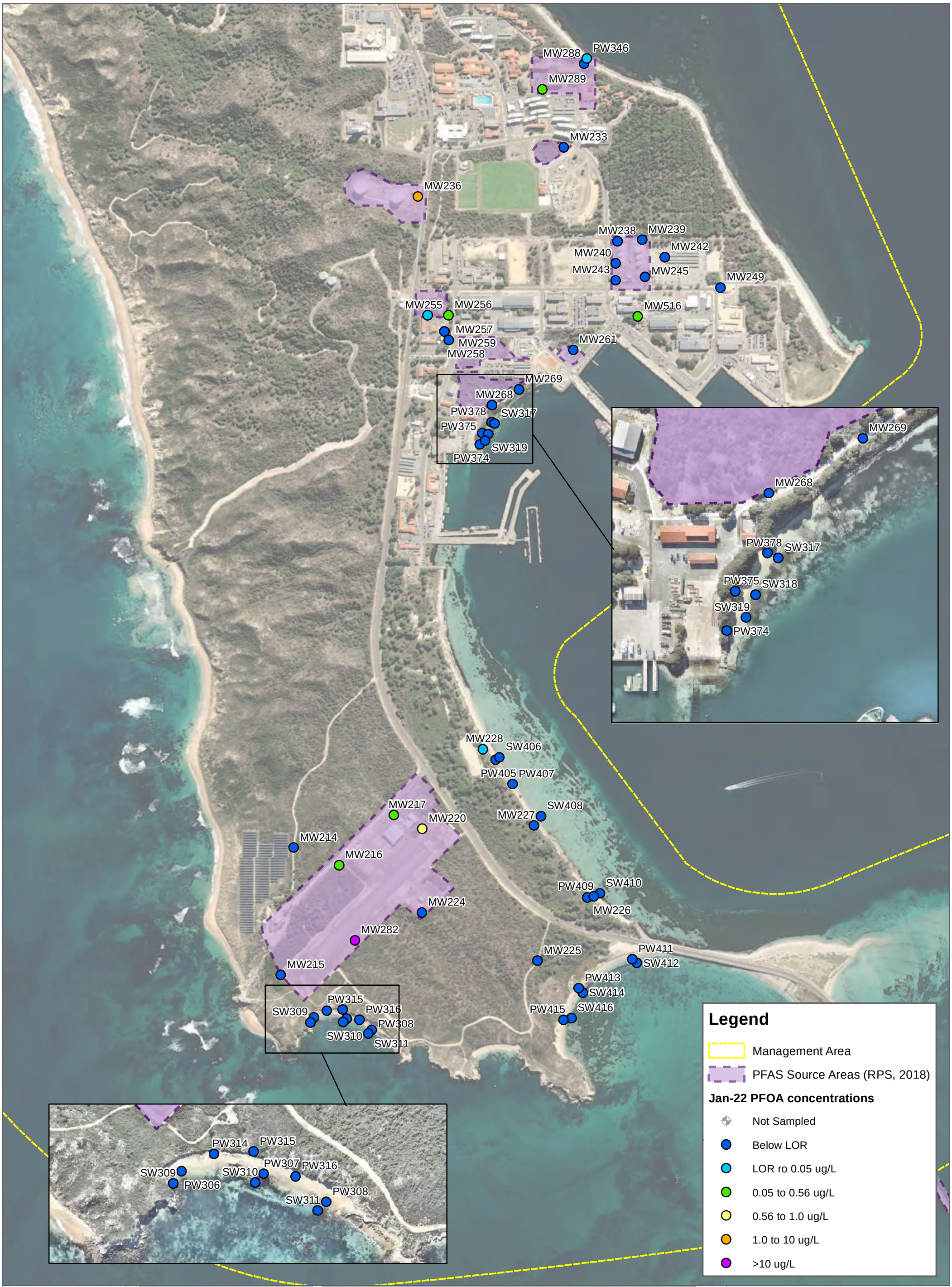

FIGURE 12C

1:10,000 Scale at A3

Metres

0 200 400

PFOA Concentrations - January 2022

2022 ANNUAL INTERPRETIVE REPORT
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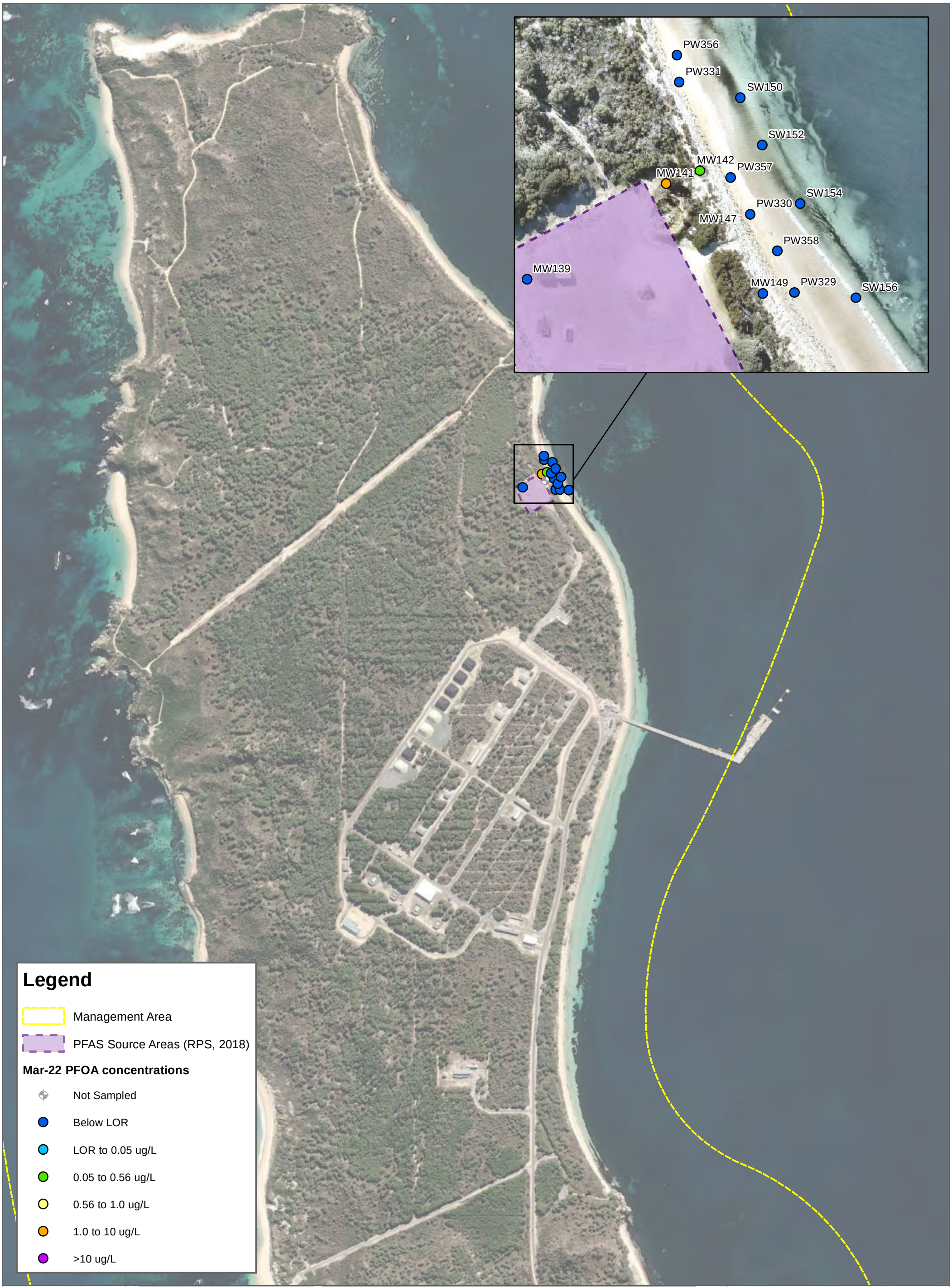
Map: DEF19009_WA_0089-GS-012C_PFOA_Jan22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap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PW331
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SW152
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PW357
MW141
SW154
PW330
MW147
PW358
MW139
MW149
PW329
SW156
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Mar-22 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
0.05 to 0.56 ug/L
0.56 to 1.0 ug/L
1.0 to 10 ug/L
>10 ug/L
FIGURE 13A
1:10,000 Scale at A3
Metres
0
200
400
PFOA Concentrations - March 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
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Aerial Imagery Supplied by Google Earth & Nearmap

PW335
PW364
MW125
SW132
PW340
PW362
MW126
PW341
SW134
PW363
SW371
PW368
PW304
SW305
SW372
SW373
MW202
MW124
SW130
PW364
PW335
SW132
MW109
MW112
MW128
MW500
PW340
PW362
MW120
MW123
MW121
PW341
SW134
MW126
PW363
MW127
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW351
MW171
PW369
PW381
SW382
PW352
MW199
PW345
SW370
MW193
MW200
PW367
SW371
PW368
PW304
SW305
SW373
MW203
MW202
MW288
PW346
MW289
MW233

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Mar-22 PFOA concentrations

- Not Sampled
- Below LOR
- LOR to 0.05 ug/L
- 0.05 to 0.56 ug/L
- 0.56 to 1.0 ug/L
- 1.0 to 10 ug/L
- >10 ug/L

FIGURE 13B

1:8,000 Scale at A3

Metres

0 150 300

PFOA Concentrations - March 2022

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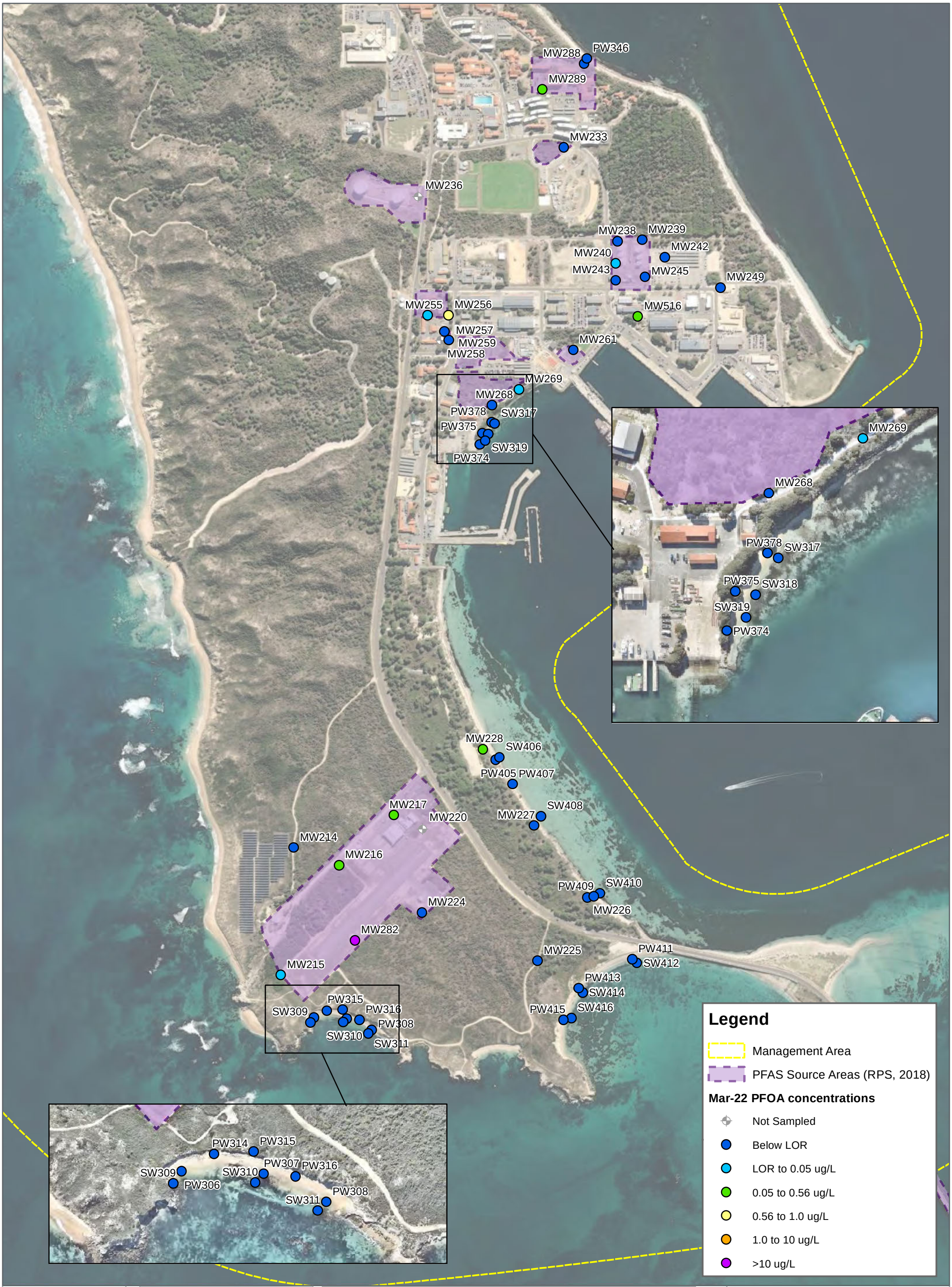
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PW346
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MW233
MW236
MW238
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MW243
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MW255
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MW259
MW258
MW261
MW269
MW268
PW378
SW317
PW375
SW319
PW374
MW269
MW268
PW378
SW317
PW375
SW318
SW319
PW374
MW228
SW406
PW405
PW407
MW217
MW220
SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
MW215
PW413
SW414
PW315
SW309
PW316
PW308
SW310
SW311
PW415
SW416
PW314
PW315
SW309
PW307
PW316
SW310
PW306
PW308
SW311
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Mar-22 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
0.05 to 0.56 ug/L
0.56 to 1.0 ug/L
1.0 to 10 ug/L
>10 ug/L
FIGURE 13C
1:10,000 Scale at A3
Metres
0
200
400
PFOA Concentrations - March 2022
2022 ANNUAL INTERPRETIVE REPORT
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DEPARTMENT OF DEFENCE
Cardno
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Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-013C_PFOA_Mar22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

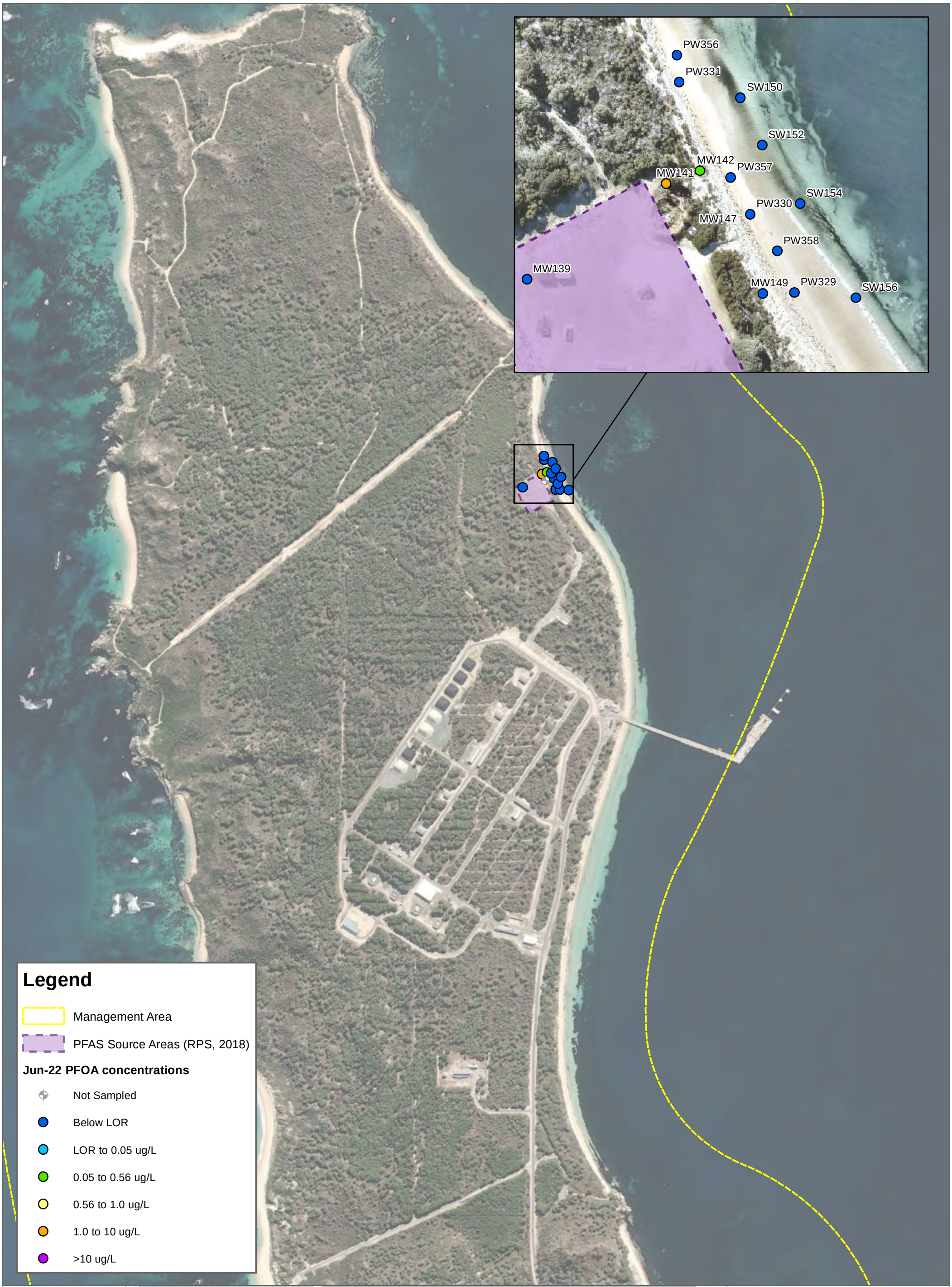

FIGURE 14A

1:10,000 Scale at A3

Metres

0 200 400

PFOA Concentrations - June 2022

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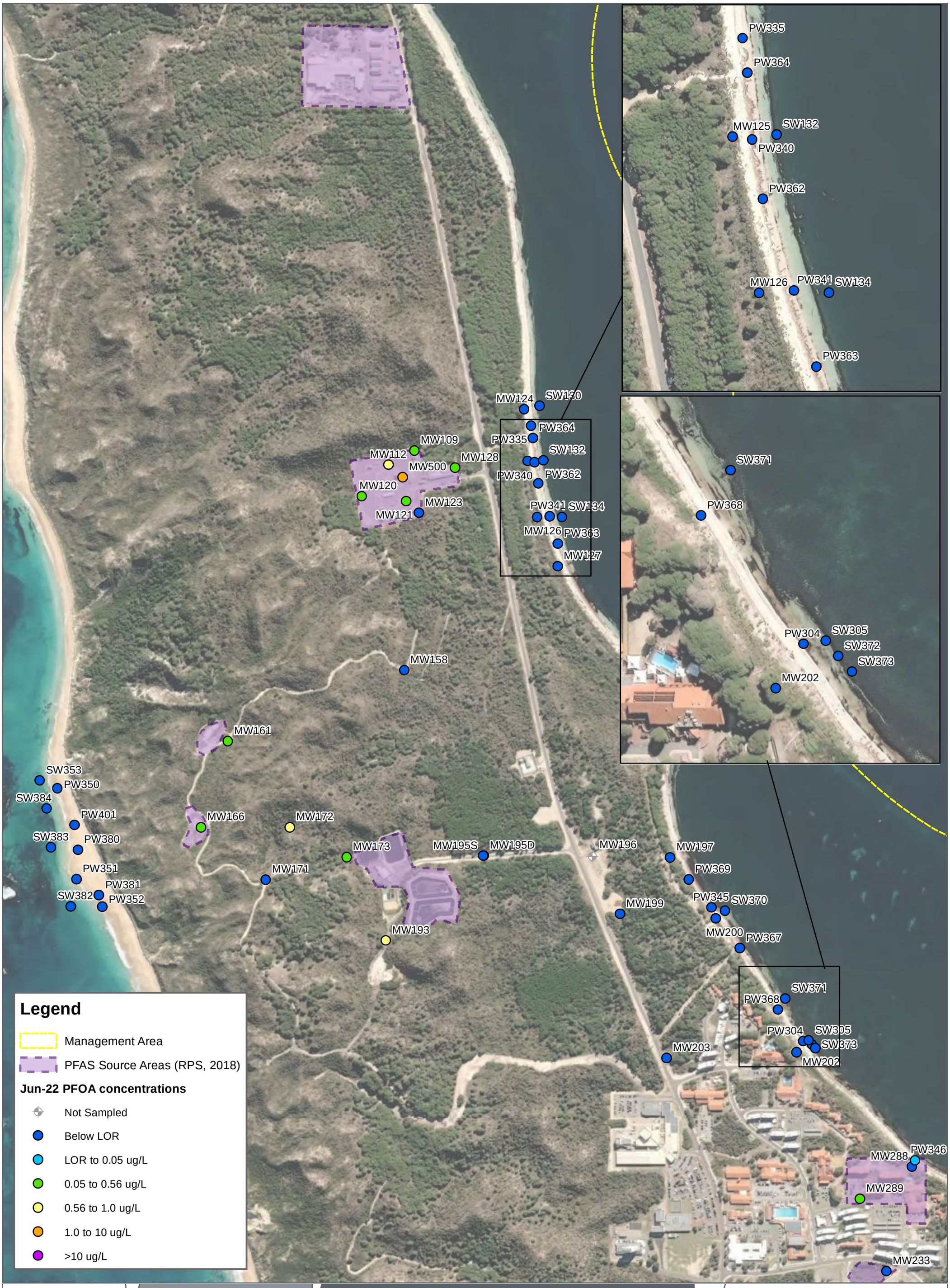
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MW202
MW124
SW130
PW364
PW335
SW132
PW340
PW362
MW109
MW112
MW128
MW500
MW120
MW123
MW121
PW341
SW134
MW126
PW363
MW127
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW369
PW351
MW171
PW381
SW382
PW352
MW199
PW345
SW370
MW193
MW200
PW367
SW371
PW368
PW304
SW305
SW373
MW203
MW202
MW288
PW346
MW289
MW233
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Jun-22 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
0.05 to 0.56 ug/L
0.56 to 1.0 ug/L
1.0 to 10 ug/L
>10 ug/L
FIGURE 14B
1:8,000 Scale at A3
Metres
0
150
300
PFOA Concentrations - June 2022
2022 ANNUAL INTERPRETIVE REPORT
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Aerial Imagery Supplied by Google Earth

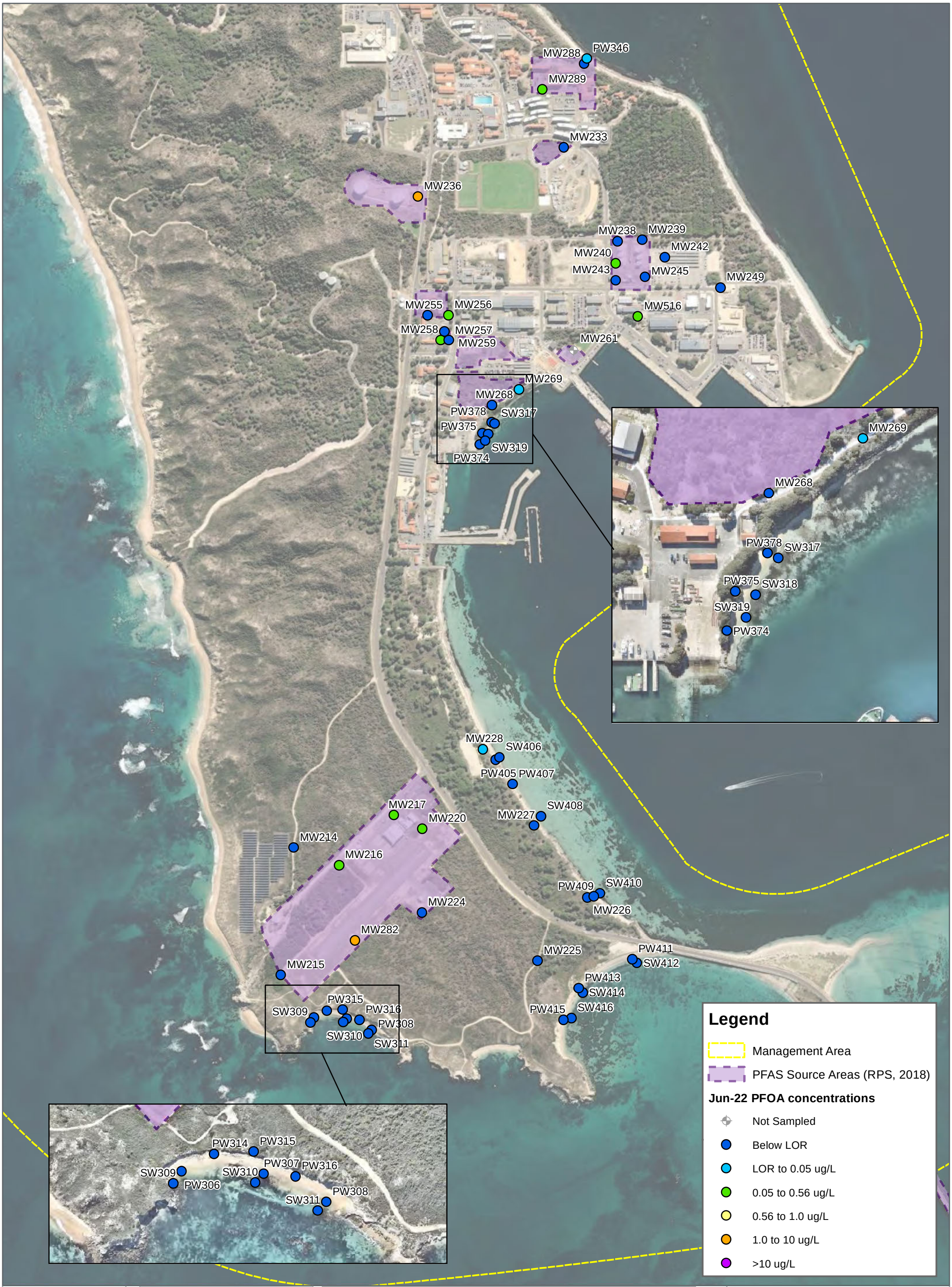

FIGURE 14C

1:10,000 Scale at A3

Metres

0 200 400

PFOA Concentrations - June 2022

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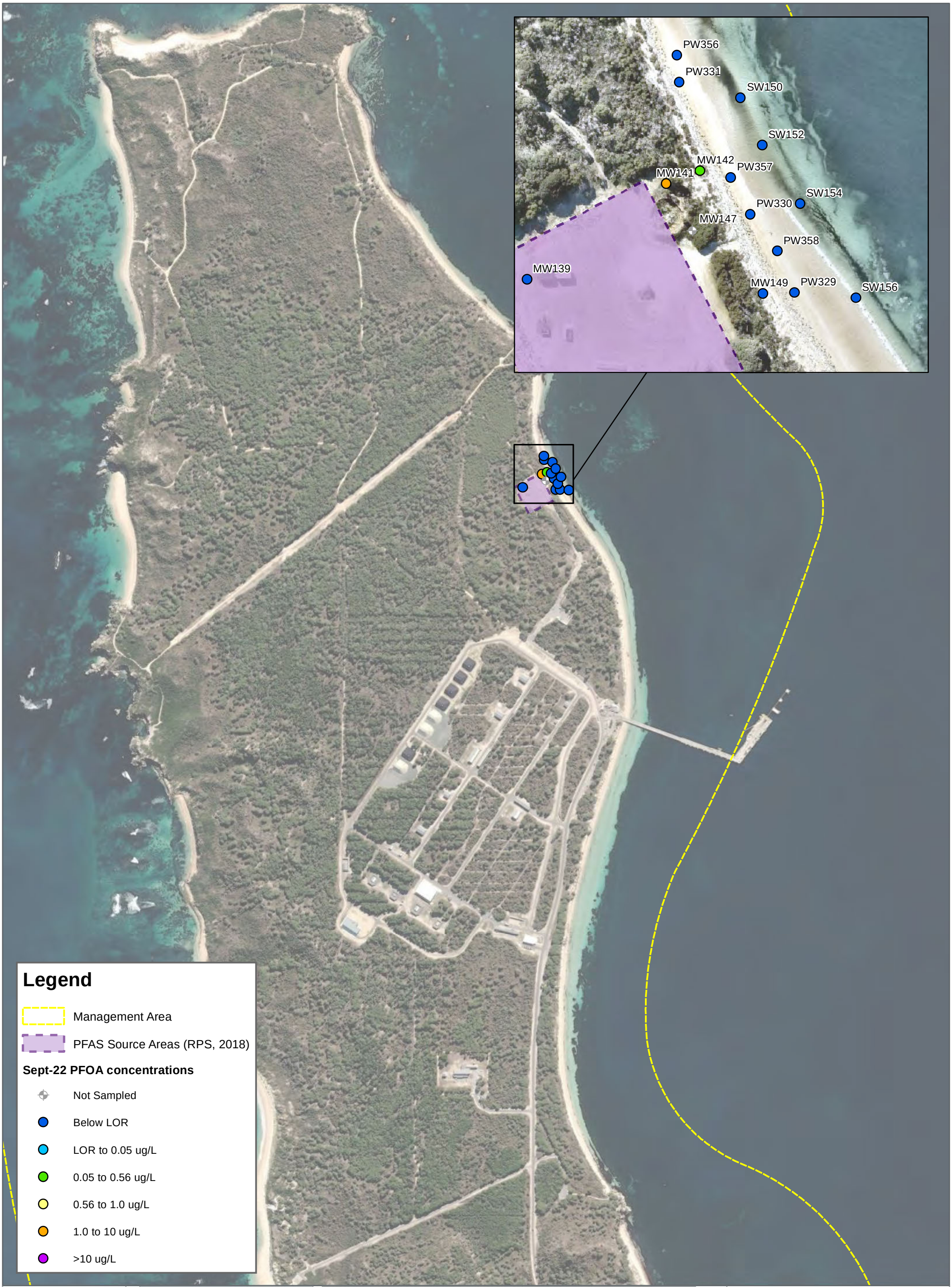
PW356
PW331
SW150
SW152
MW142
PW357
MW141
SW154
PW330
MW147
PW358
MW139
MW149
PW329
SW156
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sept-22 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
0.05 to 0.56 ug/L
0.56 to 1.0 ug/L
1.0 to 10 ug/L
>10 ug/L
FIGURE 15A
1:10,000 Scale at A3
Metres
0
200
400
PFOA Concentrations - September 2022
2022 ANNUAL INTERPRETIVE REPORT
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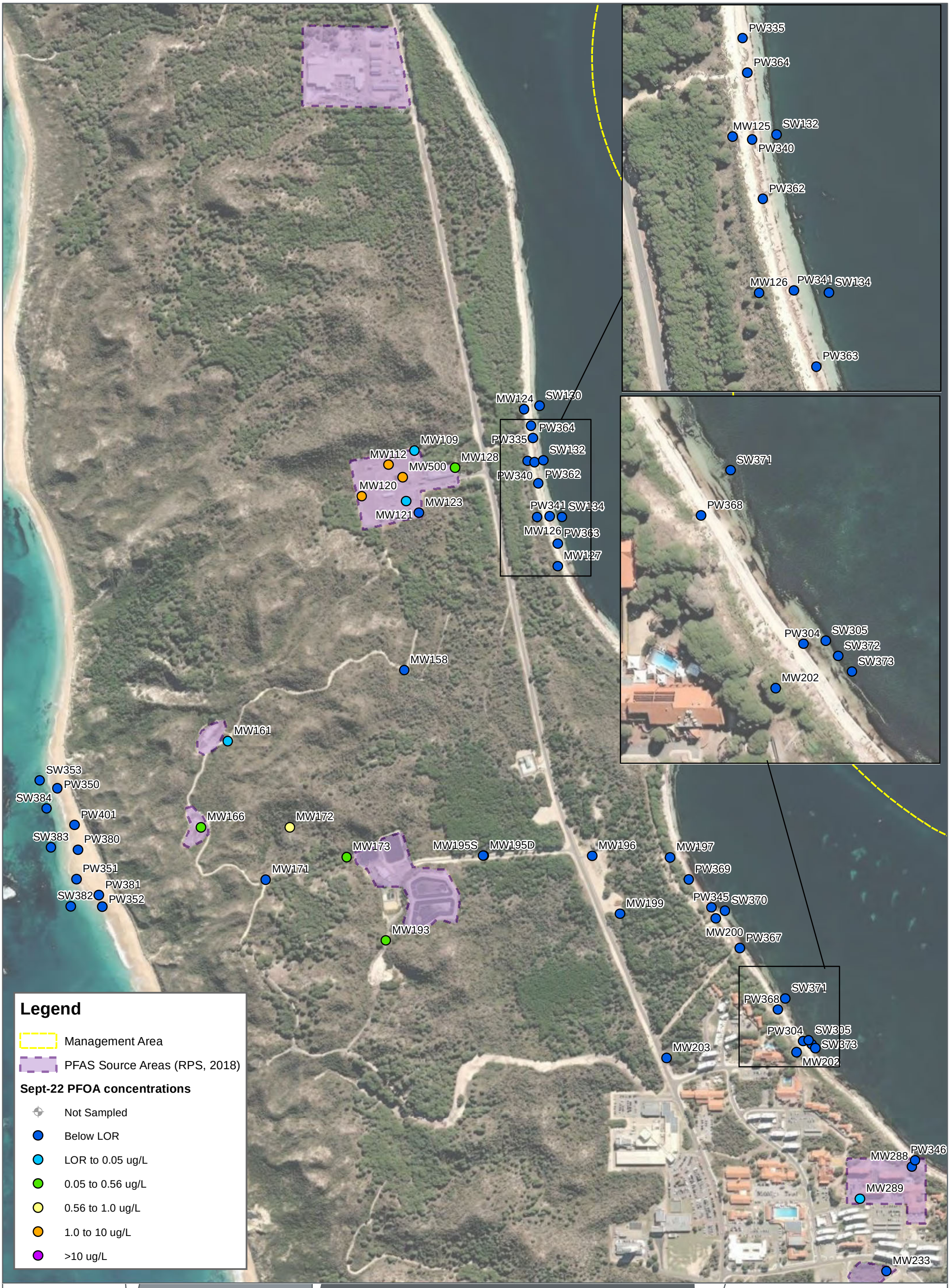
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PW340
PW362
MW120
MW123
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PW341
SW134
MW126
PW363
MW127
SW371
PW368
PW304
SW305
SW372
SW373
MW202
MW158
MW161
SW353
PW350
SW384
PW401
MW166
MW172
SW383
PW380
MW173
MW195S
MW195D
MW196
MW197
PW351
MW171
PW369
PW381
SW382
PW352
MW199
PW345
SW370
MW193
MW200
PW367
SW371
PW368
PW304
SW305
SW373
MW203
MW202
MW288
PW346
MW289
MW233
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sept-22 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
0.05 to 0.56 ug/L
0.56 to 1.0 ug/L
1.0 to 10 ug/L
>10 ug/L
FIGURE 15B
1:8,000 Scale at A3
Metres
0
150
300
PFOA Concentrations - September 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
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Cardno
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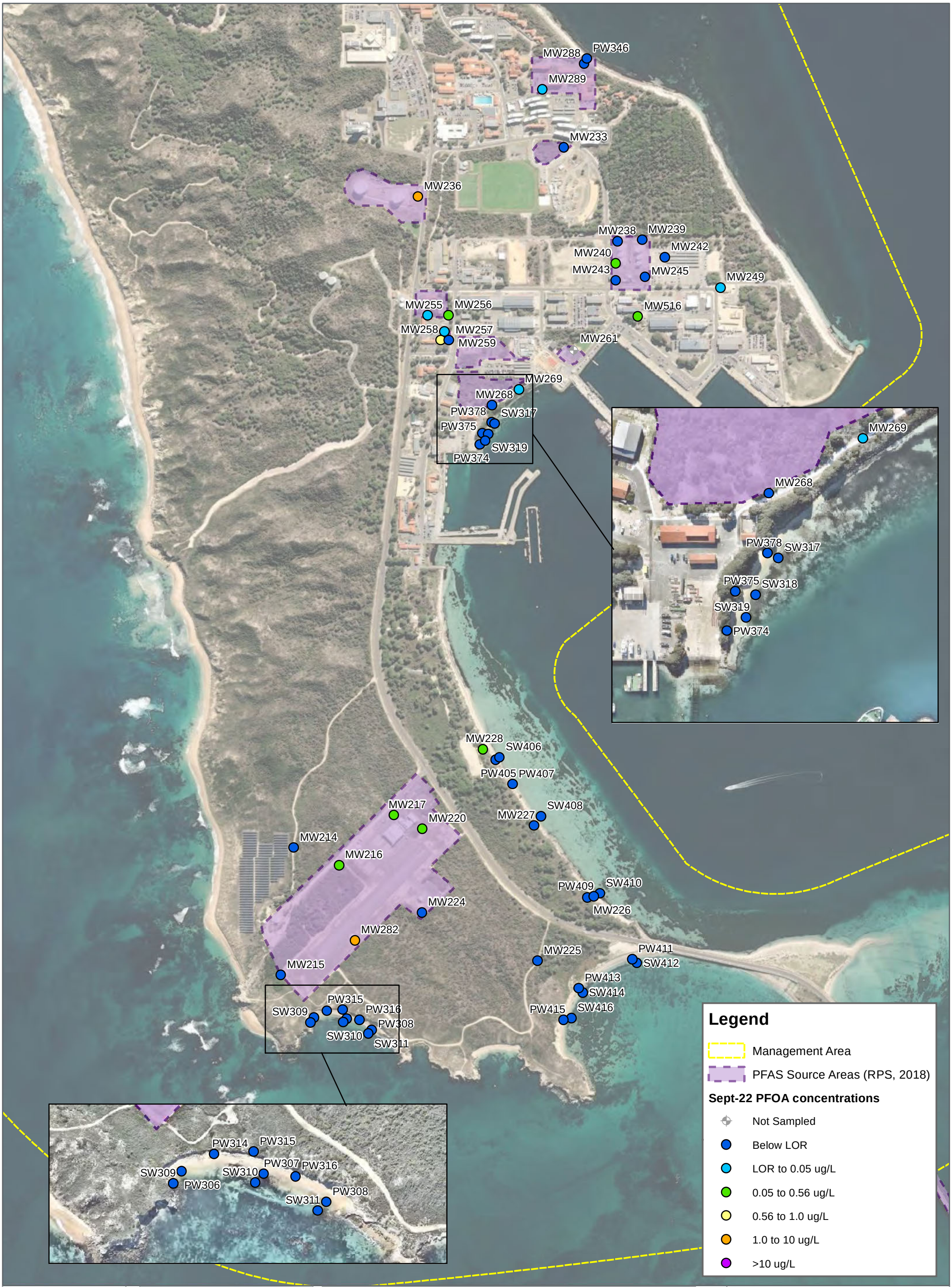
Aerial Imagery Supplied by Google Earth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MW217
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SW408
MW227
MW214
MW216
PW409
SW410
MW224
MW226
MW282
MW225
PW411
SW412
MW215
PW413
SW414
PW315
SW309
PW316
PW308
SW310
SW311
PW415
SW416
PW314
PW315
SW309
PW307
PW316
SW310
PW306
PW308
SW311
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sept-22 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
0.05 to 0.56 ug/L
0.56 to 1.0 ug/L
1.0 to 10 ug/L
>10 ug/L
FIGURE 15C
1:10,000 Scale at A3
Metres
0
200
400
PFOA Concentrations - September 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
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Map: DEF19009_WA_0089-GS-015C_PFOA_Sept22 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

SD356
SD331
SD357
SD330
SD358
SD329

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

PFOS+PFHxS concentrations

- Below LOR
- LOR to 0.002 mg/kg
- 0.002 to 0.02 mg/kg
- >0.02 mg/kg

FIGURE 16A

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - January 2022

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FIGURE 16B

1:8,000 Scale at A3

Metres

0 150 300

Sediment Concentrations - January 2022

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Map: DEF19009_WA_0089-GS-016B_SD_Jan22 01.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 16C

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - January 2022

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Map: DEF19009_WA_0089-GS-016C_SD_Jan22 01.mxd
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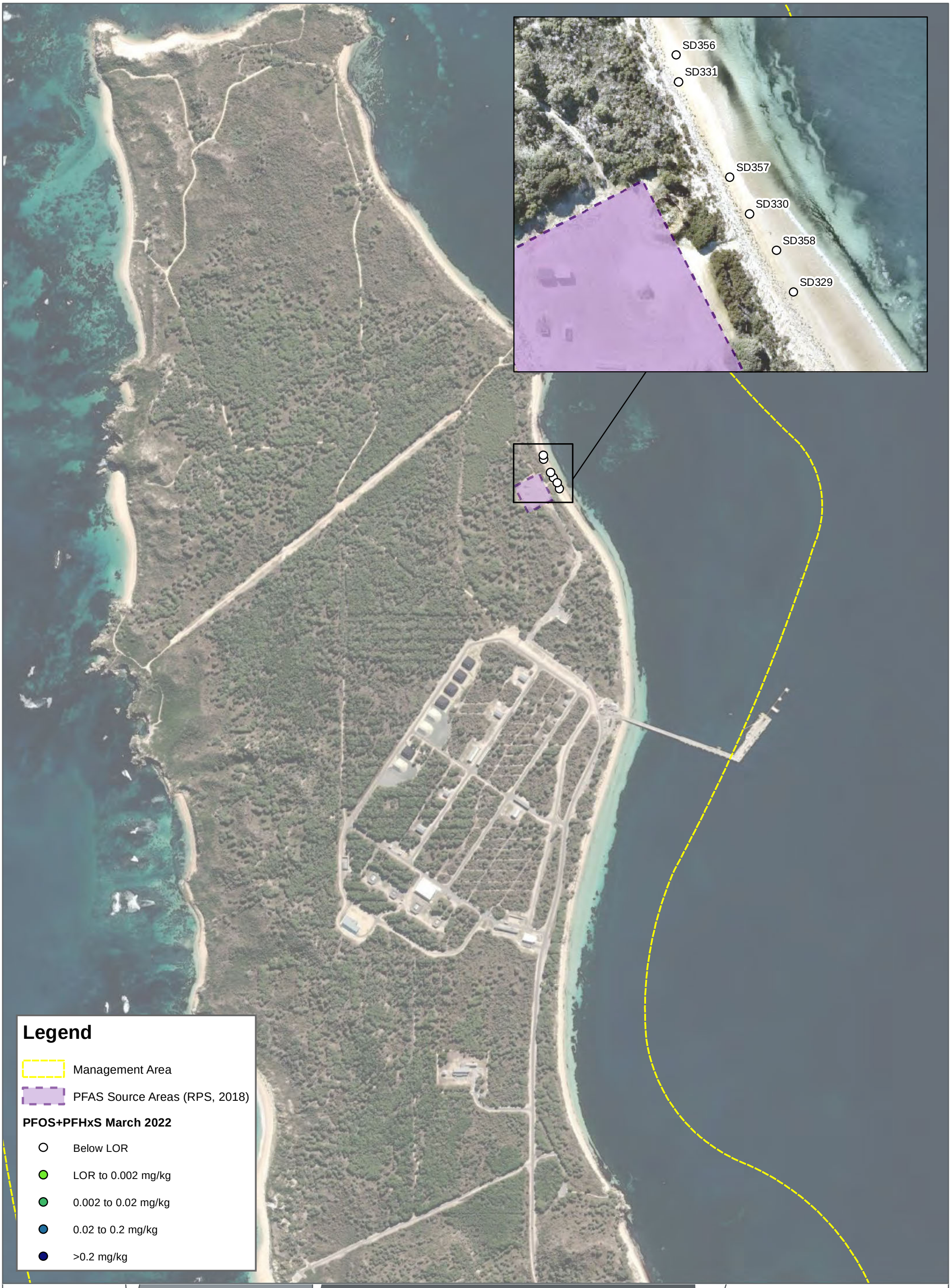
SD356
SD331
SD357
SD330
SD358
SD329
Legend
Management Area
PFAS Source Areas (RPS, 2018)
PFOS+PFHxS March 2022
Below LOR
LOR to 0.002 mg/kg
0.002 to 0.02 mg/kg
0.02 to 0.2 mg/kg
>0.2 mg/kg
FIGURE 17A
1:10,000 Scale at A3
Metres
0
200
400
Sediment Concentrations - March 2022
2022 ANNUAL INTERPRETIVE REPORT
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Cardno
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FIGURE 17B

1:8,000 Scale at A3

Metres

0 150 300

Sediment Concentrations - March 2022

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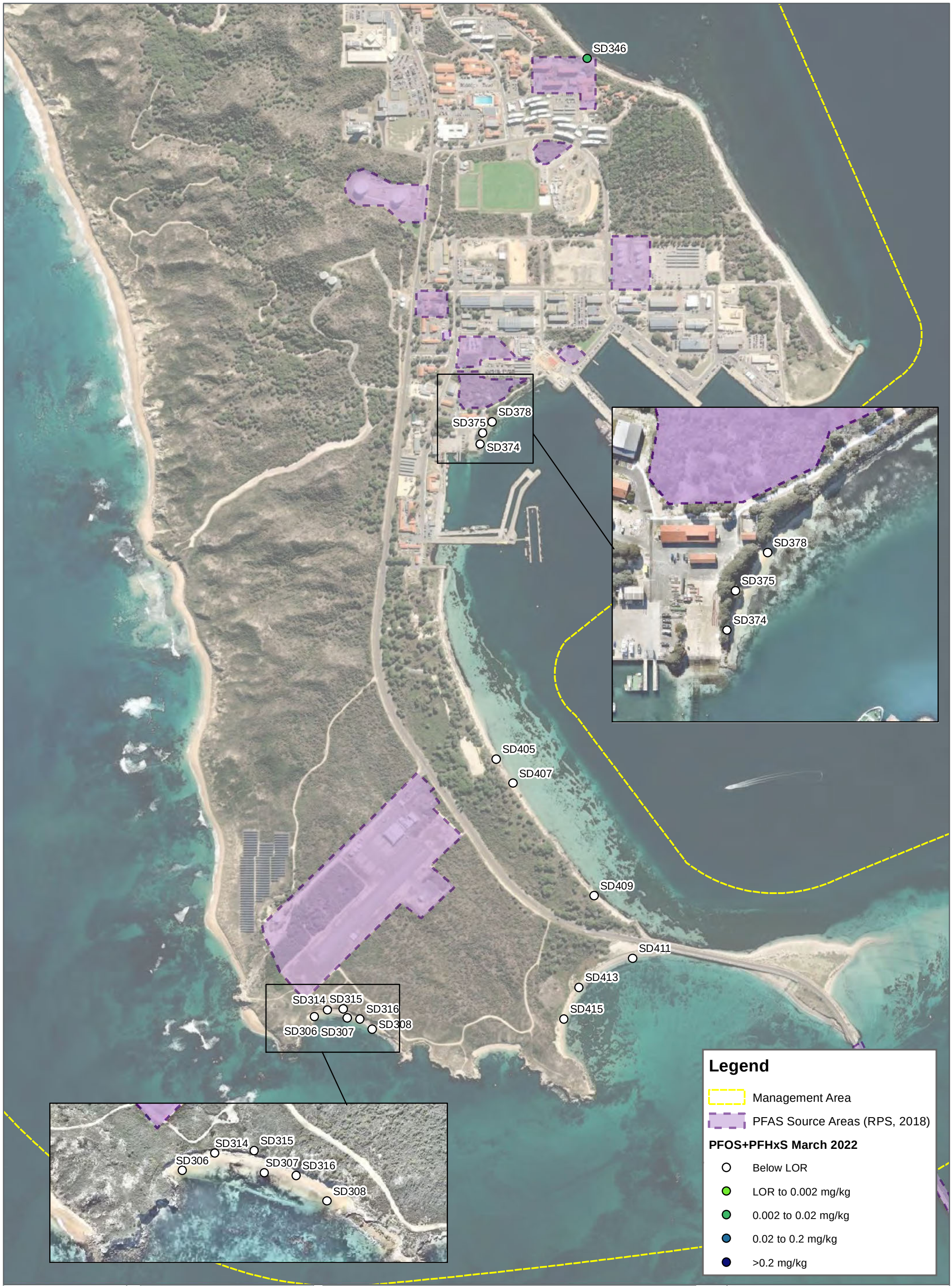

FIGURE 17C

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - March 2022

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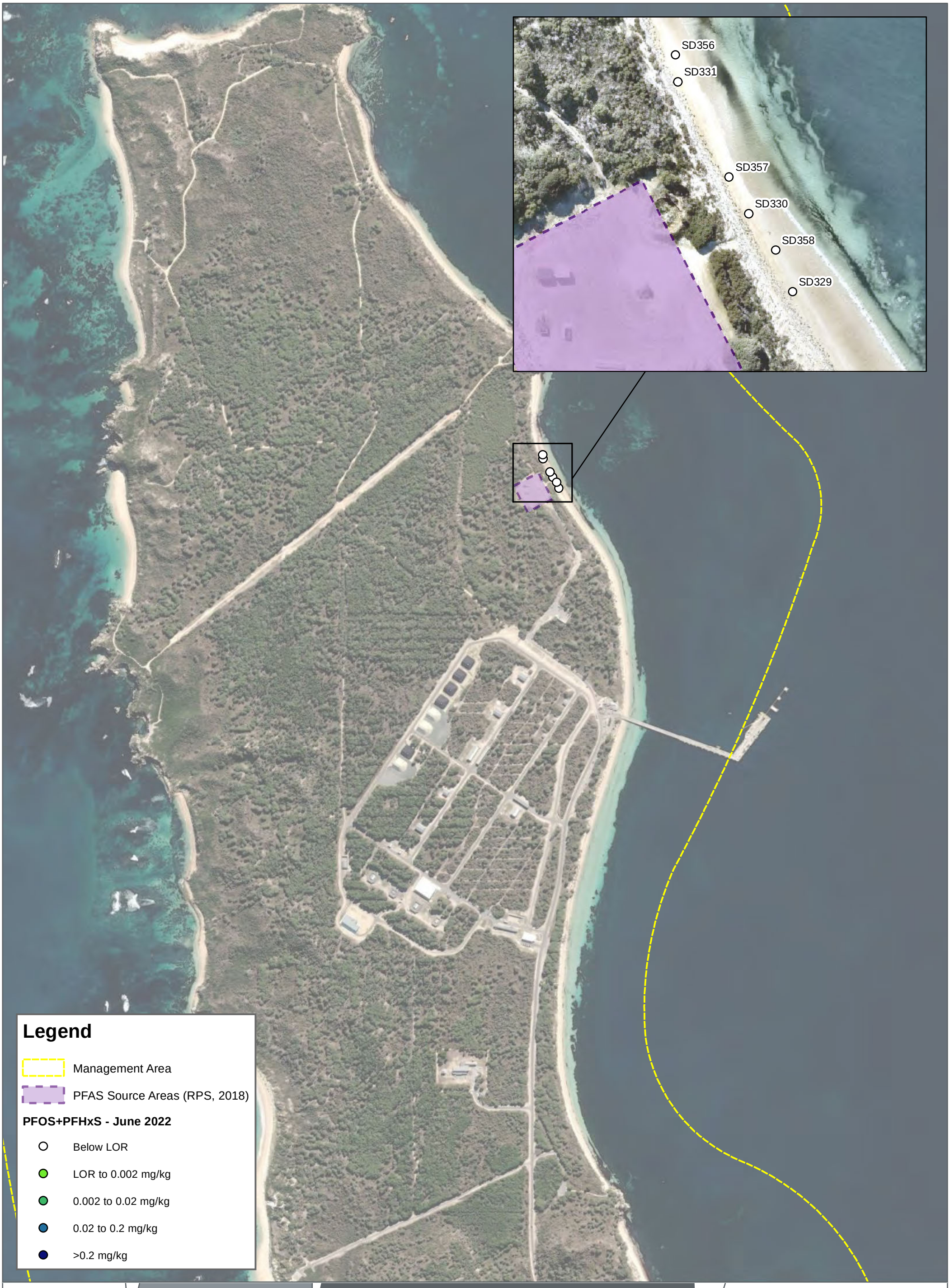
SD356
SD331
SD357
SD330
SD358
SD329
Legend
Management Area
PFAS Source Areas (RPS, 2018)
PFOS+PFHxS - June 2022
Below LOR
LOR to 0.002 mg/kg
0.002 to 0.02 mg/kg
0.02 to 0.2 mg/kg
>0.2 mg/kg
FIGURE 18A
1:10,000 Scale at A3
Metres
0
200
400
Sediment Concentrations - June 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
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FIGURE 18B

1:8,000 Scale at A3

Metres

0 150 300

Sediment Concentrations - June 2022

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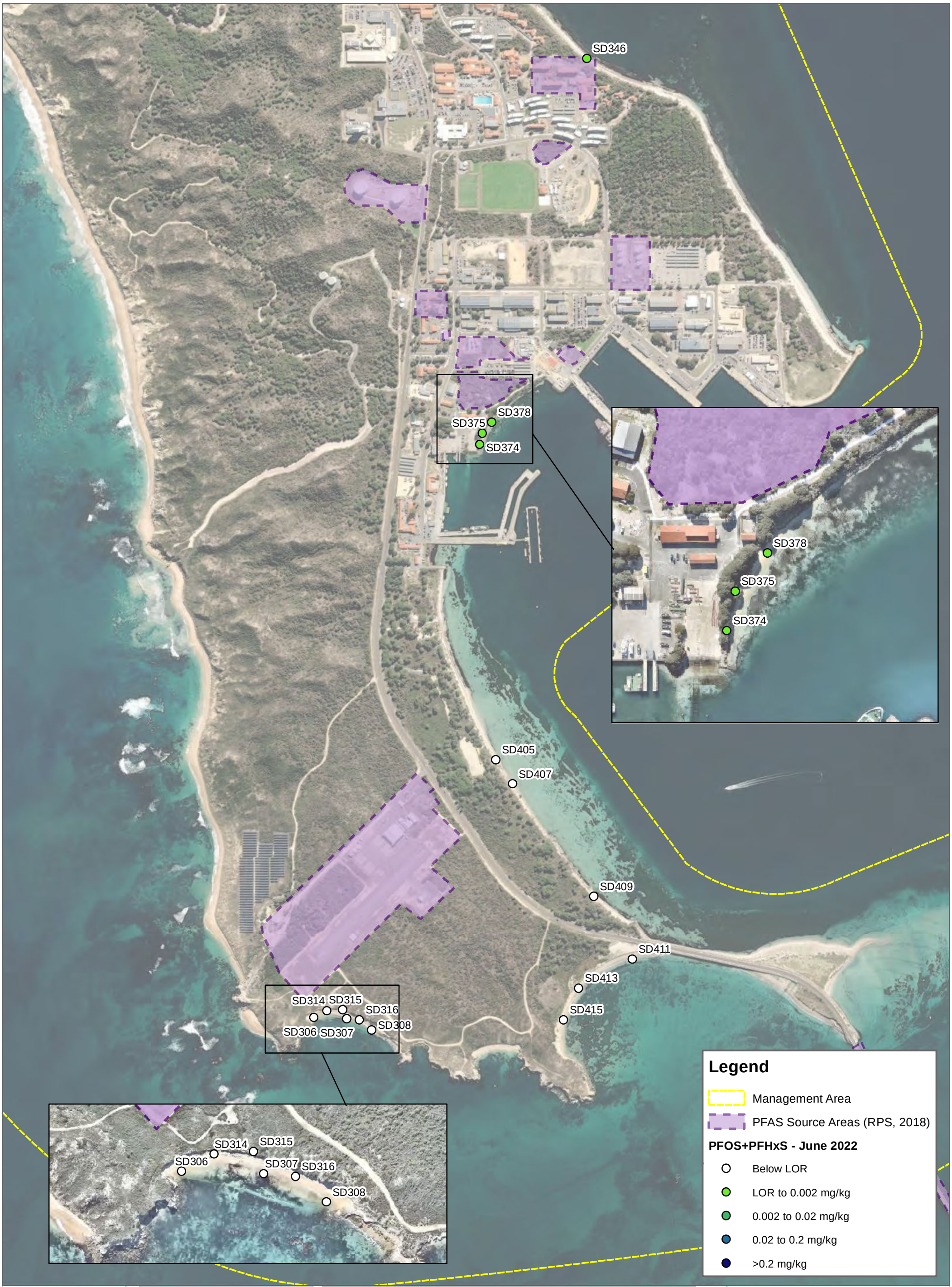

FIGURE 18C

1:10,000 Scale at A3

Metres

0 200 400

Sediment Concentrations - June 2022

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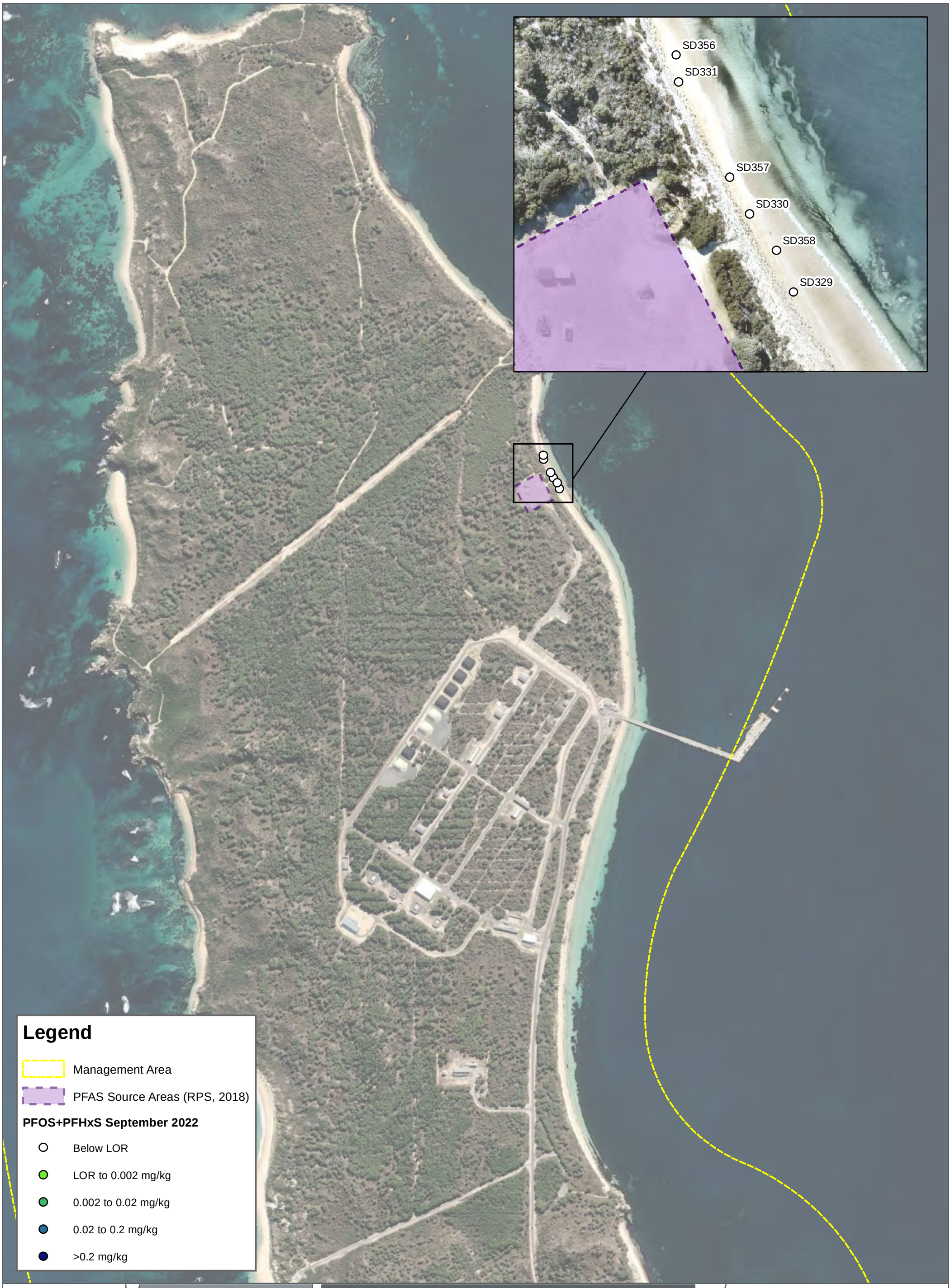
SD356
SD331
SD357
SD330
SD358
SD329
Legend
Management Area
PFAS Source Areas (RPS, 2018)
PFOS+PFHxS September 2022
Below LOR
LOR to 0.002 mg/kg
0.002 to 0.02 mg/kg
0.02 to 0.2 mg/kg
>0.2 mg/kg
FIGURE 19A
1:10,000 Scale at A3
Metres
0
200
400
Sediment Concentrations - September 2022
2022 ANNUAL INTERPRETIVE REPORT
HMAS STIRLING
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Cardno
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Aerial Imagery Supplied by Google Earth & Nearmap

SD335
SD364
SD340
SD362
SD341
SD363
SD368
SD304
SD346
SD350
SD401
SD380
SD351
SD381
SD352
SD369
SD345
SD367

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

PFOS+PFHxS September 2022

- Below LOR
- LOR to 0.002 mg/kg
- 0.002 to 0.02 mg/kg
- 0.02 to 0.2 mg/kg
- >0.2 mg/kg

FIGURE 19B

1:8,000 Scale at A3

Metres
0 150 300

Sediment Concentrations - September 2022

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Map: DEF19009_WA_0089-GS-019B_SD_Sept22 01.mxd
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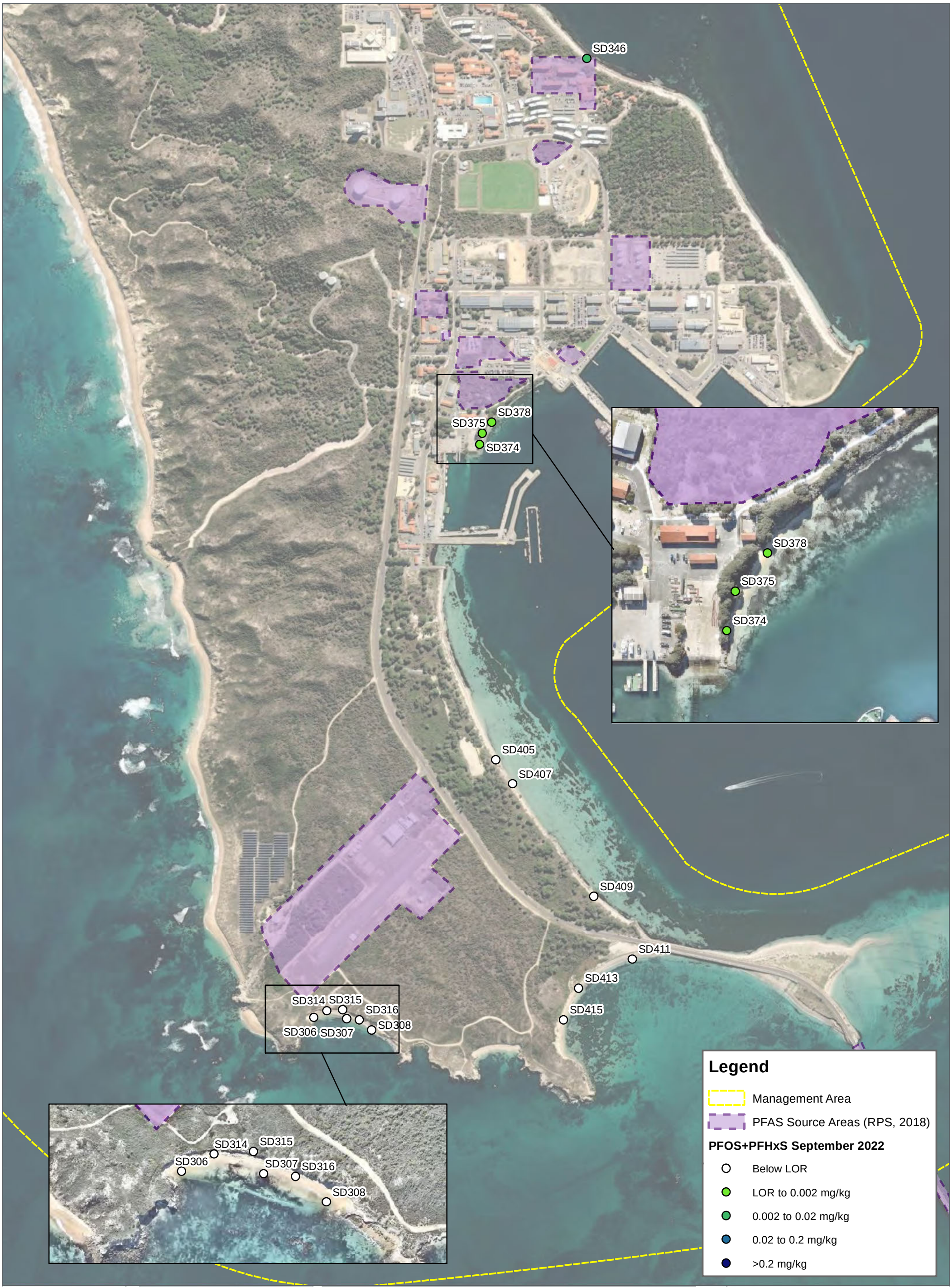

FIGURE 19C

1:10,000 Scale at A3

Metres

0 200 400

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APPENDIX

B

SAQP

Cardno

now

Stantec



PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP)

HMAS Stirling

Prepared for

Department of Defence

August 2022

Cardno®

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Rev1	5 December 2019	External Draft (Defence Review)	
Rev2	17 December 2019	Final	
Rev 3	18 August 2020	Revised	
Rev 4	15 June 2021	SAQP Review	
Rev 5	23 August 2021	SAQP Review	
Rev 6	9 March 2022	SAQP Review	
Rev 7	11 August 2022	SAQP Review	

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1 Introduction

Cardno have been engaged by the Australian Department of Defence ('Defence' or 'Client') to prepare a Sampling and Analysis Quality Plan (SAQP) as part of the Ongoing Monitoring Plan (OMP), the purpose of which to monitor trends in the extent and concentrations of per- and poly-fluoroalkyl substances (PFAS) impacts identified on and around HMAS Stirling, located on Garden Island, 4 km off the Western Australian mainland, adjacent to the suburb of Rockingham (Figure 1, Appendix A).

The OMP SAQP applies to not only HMAS Stirling, but also the surrounding areas that, together with the Base, make up the "Management Area". For the purposes of this report:

> "the Site" was defined as HMAS Stirling Garden Island (Figure 1, Appendix A).

> "the Management Area" was defined as comprising Garden Island and the marine nearshore environment (Figure 2, Appendix A).

The Site is located on Commonwealth Land and is regulated under Commonwealth environmental legislation. The OMP outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, surface water, porewater and sediment originating from the Site for an initial 24-months monitoring period. The 24-months monitoring period consists of quarterly sampling events in March, June, September and December.

1.1 Purpose & Objectives

The objective of the OMP SAQP is to present the specific monitoring locations, sampling methodologies and quality control / quality assurance measures for the monitoring of the concentrations and extent of PFAS in groundwater, surface water, porewater and sediment originating from the Site. These findings will inform risk management decisions by Defence and the Western Australian Government to protect human health and the environment.

The specific purposes of the monitoring specified in the OMP is to:

1. Evaluate change the nature and extent (spatial and temporal) of PFAS impact in groundwater, porewater and surface water pathways associated with Site sources of PFAS derived from AFFF;
2. Monitor the migration of PFAS in groundwater, porewater, sediment and surface water from the Site;
3. Provide confirmation of the current understanding of risk; and
4. Provide supporting data for assessment of management actions, where relevant.

1.2 Previous Reports

The following key reports prepared in relation to the HMAS Stirling PFAS Investigation have been used as a basis to develop this SAQP:

> Department of Defence, January 2019, HMAS Stirling Garden Island PFAS Management Area Plan, Final.

> RPS, October 2018, HMAS Stirling - PFAS Ongoing Monitoring Plan, Ref. EEC16094.005 (RPS, 2018a).

> RPS, May 2018, Detailed Site Investigation – HMAS Stirling PFAS Investigation, Ref. EEC16094.003 (RPS, 2018b).

> RPS, September 2018, HMAS Stirling Garden Island PFAS Investigation Ecological Risk Assessment. Ref. EEC16094.009 (RPS, 2018c).

> Cardno, 16 April 2020, PFAS OMP 2019 Q4 Quarterly Monitoring Factual Report, HMAS Stirling

> Cardno, 14 May 2020, PFAS OMP 2020 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling

> Cardno, 23 September 2020, PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report

> Cardno, 8 January 2020, PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report

> Cardno, 4 May 2021, PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report

> Cardno, 15 June 2021, PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report

> Cardno, 30 July 2021, Draft PFAS OMP 2020 Annual Interpretive Report

> Cardno, 5 August 2021, PFAS OMP 2021 Q2 Quarterly Sampling Event Factual Report

> Cardno, 18 November 2021, PFAS OMP 2021 Q3 Quarterly Sampling Event Factual Report

1.3 Responsible Parties

Responsible parties and responsibilities associated with the implementation of the OMP are detailed in Table 1-1.

Table 1-1 Responsible Parties

Role	Responsibilities
Department of Defence – PFAS Investigation and Management Branch	▪ Implement this OMP. ▪ Engage suitably qualified environmental consultants/contractors to carry out the works specified in the OMP
HMAS Stirling – Base Support Manager/ and Environment and Sustainability Manager	▪ Review and approve all necessary permits required for implementation of the works outlined in the OMP.
Environmental Consultant	▪ Obtain necessary permits from HMAS Stirling to implement the works outlined in the OMP. ▪ Undertake the monitoring activities outlined in this SAQP. ▪ Produce a monitoring report that summarises the data and findings of each monitoring event and is consistent with the requirements of this SAQP. ▪ Produce an annual interpretative report including recommendations for any potential changes in the location and frequency of sampling which may be incorporated in the revision of the OMP. ▪ Upload analytical data from each monitoring event to the relevant Defence ESdat database.

1.4 Relevant Guidelines

This SAQP has been prepared in general accordance with the WA *Contaminated Sites Act 2003* (CS Act), applicable industry standards and guidelines relevant to an assessment of this type, and has been formulated in reference to the following:

> National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013)* (ASC NEPM).

> Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan 2.0 (NEMP)*.

> Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.

> Australian Standard AS 4482-1999 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 2 - Volatile substances*.

> Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.

> Australian and New Zealand Guidelines, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*

> Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.

> U.S. Environmental Protection Agency (EPA), 2000, '*Guidance for the Data Quality Objectives Process (EPA QA/G-4)*'.

> USEPA, 2002, '*Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.*

- Department of Water and Environmental Regulation (DWER), 2014 (as amended 2021), *Assessment and Management of Contaminated Sites*[1].
- National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

1.5 Standards of Assessment and Limitations

This SAQP has been prepared in general accordance with the current industry standards for an assessment of this type for the purpose, objectives and scope identified in this report.

The scope presented in this SAQP report are derived only from available desk-based information and site inspection undertaken. This SAQP is not any of the following:

- A Mandatory Audit Report (MAR) or Voluntary Audit Report (VAR) as defined under the *Contaminated Sites Act 2003* (CS Act).
- A Geotechnical Assessment.
- A Detailed Site Investigation (DSI).
- A Detailed Hydrogeological Assessment.
- A Remediation Action Plan (RAP) or Site Remediation & Validation (SRV) report.
- A Site Management Plan (SMP).

2 Site Description and Management Areas

HMAS Stirling is located on Garden Island within Cockburn Sound, situated approximately 4 km off the WA mainland and connected to the mainland via a bridge in the south of the Island. The Island is 12 km long and 1.5 km wide at its widest point and covers an area of 1,274 hectares (ha).

Defence facilities occupy approximately 28% of the Island, with the majority focused around Careening Bay on the south east, with other support facilities located in other portions of the Island.

The Island is divided into eight administration areas:

- Causeway Sector
- Helicopter Support Sector
- Beagle Road Sector
- Careening Bay Sector
- Torpedo Maintenance Sector
- Fireground Sector
- RANAWED Sector
- Herring Bay Sector

The buildings and associated infrastructure and support services include:

- Accommodation blocks
- Helicopter Support Facility
- Fire Station

[1] It is noted that Site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-Site nearshore marine environment.

- Fuel Farm
- Flammable / Hazardous goods and waste Storage
- AVCAT Storage Facility
- Waste Water Treatment Plant (WWTP)
- Seepage ponds
- Shipping berths and ship sullage area
- Maintenance and workshop areas
- Demolition ground
- Fire Training area

2.1 Site Definition and Planning

For the purposes of this SAQP report, “the Site” was defined as comprising HMAS Stirling Garden Island. A detailed description of the Site is provided in RPS’s DSI Report (RPS, 2018b). The site location is presented on Figure 1, Appendix A.

Key Site identification details are presented in Table 2-1.

Table 2-1 Site Identification Details

Details	Description
Site Address	Garden Island, WA
Land Description	HMAS Stirling
Owner	Commonwealth of Australia
Title Details	Lot 9 on Plan 226190
Planning Zone / Land use	Naval Development
Local Government Authority (LGA)	City of Rockingham

2.2 Surrounding Land Uses and Zoning

Cockburn Sound is used for a variety of activities both commercial and recreational including:

- Fishing
- Water sports
- Shipping

Kwinana Industrial Area is located immediately opposite Garden Island on the mainland side of Cockburn Sound. Activities occurring in the Kwinana Industrial Area include:

- Petroleum products
- Fertiliser production
- Chemical production
- Cement production
- Bulk material handling
- Metal refining
- Waste management
- Kwinana Power Station

3 Environmental Setting

Key details defining the site are summarised in Table 3-1.

Table 3-1 Key Site Details

Setting	Description
Climate	The Perth region, including Garden Island has a warm summer, cold winter Mediterranean climate. Mean maximum temperatures on the Island occur in February (28.3 ºC) while mean minimum temperatures occur in July (11.2 ºC). Rainfall is winter dominant, with the highest volume of rainfall typically occurring in July with a mean monthly rainfall amount of 115.5 mm.
Topography	Topography on Garden Island ranges from sea level, 0 meters relative to the Australian Height Datum (m AHD) along the eastern coast line to 55 mAHD within the middle of the Island. Steep dunes and limestone cliffs of up to 10 mAHD characterise the western perimeter of the Island, whilst the eastern perimeter is relatively flat.
Acid Sulfate Soil	A review of the Acid Sulfate Soils (ASS) risk mapping, available on the WA Atlas online database indicates no known risk of ASS occurrence within three meters of natural ground surface for the Site.
Hydrology	There are no natural surface water bodies on the Island, with any stormwater falling outside developed areas anticipated to infiltrate directly into the sandy soils and into the underlying superficial aquifer. Garden Island is surrounded by the Indian Ocean and the Cockburn Sound. Groundwater (and potentially PFAS) leakage between the superficial and deeper aquifers is unlikely at the northern half of Garden Island due to the presence of the Kardinya Shale confining unit. However, there is potential for groundwater and PFAS leakage between the superficial aquifer and underlying Rockingham Sand at the southern half of the Island where the Kardinya Shale is not present (RPS, 2018b).
Geology	**Regional Geology** Garden Island is an offshore outcrop of Tamala Limestone and part of the Garden Island Ridge, the WA Department of Mines and Petroleum 1:50,000 geological map series indicates the surface is Calcareous Sand (S2 and S13) (i.e. Safety Bay Sand – white medium grained rounded quartz and shell debris well sorted of eolian origin). **Site Specific Geology** Logs from the drilling of groundwater wells and soil cores during previous sampling programs (ENSR 2009, RPS 2018) indicate the geology of the Site varies with topography. The Demolition Ground in the north coast of the Island contains Safety Bay Sand to at least 5 meters below ground level (mbgl), and at the WWTP Safety Bay Sands were encountered down to 29 mbgl. Layers of limestone were encountered in certain areas (e.g. Fire Training Area at 1-2 mbgl and around the WWTP at 7-15 mbgl). Fill sands containing brick rubble and limestone cobbles were also encountered in the Fire Training Area to a depth of 1 mbgl.
Hydrogeology	▪ **Groundwater Occurrence** – The superficial aquifer at Garden Island, whilst geologically connected, is not hydraulically connected to the superficial aquifer of the mainland as both discharge to the near shore marine environment. The underlying confined aquifers, the Leederville and deeper Yarragadee, typically extend tens of kilometres offshore beneath the seabed and are thought to discharge terrestrial groundwater to the ocean several kilometres from the coast (Davidson, 1995). At the South of the Island the superficial aquifer extends to a depth of around 20 mbgl, with an aquitard (Kings Park Formation) at ~90 mbgl, overlying the Kardinya Shale around 140 mbgl, overlying the Leederville aquifer at ~165 mbgl. In the north of the Island, the Kardinya Shale is present at significantly shallower depth than in the south (~37 mbgl) and forms an aquitard to the deeper Leederville Formation at ~181 mbgl. ▪ **Depth to Groundwater** – The depth to groundwater is affected by the topography of the Island. Along the coast line groundwater is found at shallow depth (2-3 mbgl), whilst around the WWTP groundwater is up to 21 mbgl. The depth to groundwater, especially along the coastal fringes, will be influenced by tides within the surrounding marine environment.

Setting	Description
	▪ **Groundwater Flow Direction** – Regional groundwater flow direction are anticipated to be towards the marine environment, with flow on the east of the dunal system towards Cockburn Sound and flow towards the Indian Ocean on the west of the dunal system. Tidal pressure can influence localised flow direction in the vicinity of the coastline. **Salinity –** The superficial groundwater is classified as brackish by the DWER Perth Groundwater Atlas, with a total dissolved solids (TDS) in the range of 500 – 1,000 mg/L. ▪ **Groundwater Use** – Groundwater is not abstracted on the Island for potable or non-potable use. Potable water for Garden Island is supplied from the Rockingham town water supply. The DWER groundwater database found two registered abstraction bores (Leederville Aquifer) on the mainland within 20 km of Garden Island. These bores are used for irrigation and industry. RPS ruled out any risk of PFAS impact to these bores according to the calculated groundwater travel time (RPS, 2018b).
Environmental Sensitive Areas	Due to its significant natural and cultural heritage values, the Island is protected by the *Environment Protection and Biodiversity Act 1999* (EPBC Act). Several vulnerable species of flora have also been listed as endangered ecological communities. The vegetation on the Island is also included in Bush Forever Site 63, with the Bush Forever policy providing a framework for bushland protection and management issues in WA. Additionally, the seagrass meadows along the eastern margin of Garden Island are a significant remnant population of seagrass in Cockburn Sound and are protected under the *State Environmental (Cockburn Sound) Policy 2015*.
Further information can be found in the Consolidated DSI report (RPS, 2018b).	

4 Source Areas and Risk

The Site has been subject of previous PFAS investigations, including:

> Environmental Review of Fire Fighting Training and Facilities (AURECON, 2010)

> Environmental Investigation of AFFF Spill at Fleet Base West, Preliminary Site Investigation (AECOM, 2012)

> Defence Per- and Poly-fluoroalkyl Substances (PFAS) Environmental Management Preliminary Sampling Program (GHD, 2016)

> Stage 2 Detailed Site Investigation (Greencap, 2017)

> Sampling and Analysis Quality Plan HMAS Stirling – PFAS Investigation (RPS, 2017)

> Detailed Site Investigation – HMAS Stirling PFAS Investigation (RPS, 2018b)

> Ecological Risk assessment, HMAS Stirling – PFAS Investigation (RPS, 2018c).

4.1 Source Areas

Various PFAS source areas across the Island were identified resulting from historical AFFF use/storage. These locations are shown on Figure 2, Appendix A and include:

> Fire training area

> Helicopter support facility

> Demolition ground

> Waste water treatment plant (WWTP)

> AVCAT storage, fuel farm and infiltration swale

> Fire station

> Dredged sediments

- Ship sullage area
- Flammable/hazardous goods and waste storage
- Accommodation area.

The results of the DSI (RPS, 2018b) indicate that PFAS was identified in all assessed matrices (soil, groundwater, surface water, sediment and porewater) in at least one location on the Island.

5 Data Quality Objectives

Development of data quality objectives (DQOs) for the OMP SAQP is based on guidance presented in the ASC NEPM (NEPC 2013) and are consistent with the HMAS Stirling PFAS Ongoing Monitoring Plan (RPS, 2018b). The DQO process comprises the following seven steps:

- Step 1: State the problem
- Step 2: Identify the decision/principal study question(s)
- Step 3: Identify the Inputs into the Decision
- Step 4: Study Boundaries
- Step 5: Decision rules
- Step 6: Tolerable limits on decision errors
- Step 7: Optimisation of the data collection process

The DQOs are detailed in Table 5-1.

Table 5-1 Data Quality Objectives

Data Quality Step	Description
State the Problem	Sampling and analysis completed as part of the DSI (RPS, 2018b) and ERA (RPS, 2018c) conducted at the Site have identified concentrations of PFAS in soils, sediments, groundwater, surface water and porewater resulting from historical use of AFFF on Garden Island. The DSI and ERA confirmed that there is no significant risk from the identified PFAS concentrations to human health or ecological receptors. To confirm the current understanding of risk identified in DSI/ERA investigations, quarterly monitoring over a 24-months period is required which will provide confirmation of PFAS concentrations allowing for seasonal variability. **Groundwater** ▪ PFAS were detected above the LOR within all wells at the fire training area, the WWTP and the demolition ground (RPS, 2018b) with exceedances of adopted guidelines observed. ▪ Exceedances of the guidelines adopted to be protective of human health were observed in groundwater. The human health risk is generally considered to be low in regards to the groundwater uses however, there remains a potential risk to maintenance/construction workers. **Surface Water** ▪ Surface water concentrations are above adopted guidelines along the coastline, at the Demolition Ground, WWTP, and Helicopter Support Facility and as such may pose a risk to marine ecological receptors. ▪ Although recreational fishing and shell fishing may be undertaken on a limited basis around the Island, there is limited potential for dietary ingestion of PFAS to be a significant pathway due to the low levels of PFAS detected in marine sediment and surface water. **Sediment and Porewater** ▪ Soils at the Fire Training Area, Helicopter Support Facility and Fire Station pose a risk to the local ecology via direct contact to organisms, plant and fauna. The risk posed by soils to the local marine ecology was considered to be low.

Data Quality Step	Description
	▪ Sediments at the Fire Station were found to contain PFOS above the adopted assessment levels which may act as a source for the migration of PFAS to groundwater and the subsequent lateral migration to marine sediments, porewater and surface waters. ▪ Whilst there are no current pore water guidelines, concentrations within pore water were above adopted groundwater and surface water guidelines at the demolition ground, WWTP and dredged sediment areas. Groundwater may transport PFAS into coastal marine environments where it mixes with the sediments pore water. PFAS concentrations in pore water above adopted ecological guidelines pose a risk from bioaccumulation and biomagnification. Most of the sampling locations (groundwater, surface water, and sediment sampled as part of the DSI) have only been tested once or twice (i.e. limited time series/seasonal data). A robust dataset is required to assess trends in the nature, extent and magnitude of PFAS concentrations within sediment, surface water and groundwater to validate/improve the understanding of the CSM in relation to spatial and temporal variability of PFAS concentrations within the Management Area and associated receptors.
Identify the decision/principal study question(s)	This OMP is to provide further data to assess the following principal study questions: ▪ What are the changes and trends in the nature, extent and magnitude of PFAS concentrations in the groundwater, surface water and sediment within the Management Area? ▪ Has the nature, extent and magnitude of PFAS concentrations changed significantly to warrant a revision of the ERA? ▪ Has the nature, extent and magnitude of PFAS concentrations changed significantly to warrant refinement of any existing management measures? ▪ Has the nature, extent and magnitude of PFAS concentrations changed significantly or are they likely to change?
Identify the Inputs into the Decision	The following inputs are required to resolve the principal study questions outlined in Step 2: ▪ PFAS concentrations in groundwater, surface water, porewater and sediment from previous and future monitoring events. ▪ Field data (i.e. groundwater levels, physico-chemical parameters) on groundwater, porewater and surface water from previous and future monitoring events. ▪ An appropriate statistical evaluation of the data (e.g. using Mann-Kendall or similar analysis) including short- and long-term trends, in particular for surface water and groundwater concentrations. ▪ Comparison of data sets to relevant endorsed assessment levels (refer to Section 7).
Study Boundaries	Ongoing monitoring will be undertaken within the boundaries of the Management Area (Figure 2, Appendix A) at the groundwater, surface water, porewater and sediment monitoring locations outlined in Sections 6.3.1 and 6.4.1. Monitoring will be undertaken every three months, with one monitoring event in March, June, September and December. Section 6 provides further detail on the monitoring frequency.
Develop a Decision Rule	▪ The analytical and field data will be used to assess changes to the nature, extent and magnitude of PFAS in surface water, sediment and groundwater and to provide supporting data for assessment of management actions, where relevant. ▪ Trends in PFAS concentrations, including an assessment of temporal and spatial changes, will be assessed using an appropriate statistical analysis approach (e.g. using Mann- Kendall, GWSdat or similar analysis), with a specified level of confidence based upon the number of monitoring rounds completed. ▪ The analytical data will be compared to the relevant assessment levels (presented in Section 7) and/or historic concentrations (i.e. maximum concentration) recorded during prior monitoring rounds [i.e. during the DSI (RPS, 2018b)] to evaluate changes in the risk profile and whether revision of the OMP, ERA or implemented management measures is warranted. Where exceedances of adopted assessment criteria levels (presented in Section 7) or new detections are reported, further interrogation of data will be undertaken to the

Data Quality Step	Description
	extent relevant to assess the risk profile and location. A summary of the key decision rules as detailed below: 1. Have the analytical data collected as part of the monitoring program met the DQI (refer Table 5-2.below)? If yes, then the data can be used to answer the decision rule below and the decision statements developed in Step 2. If no, then an assessment of the need to collect additional data will be required. 2. Do PFAS concentrations exceed the investigation criteria? If no, then the contamination would be considered not to pose an unacceptable risk. Where results exceed the adopted investigation criteria, this may not necessarily indicate an unacceptable level of risk. Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts. 3. Has PFAS been detected in any bores previously not detected? If yes, do PFAS concentrations reported indicate an increasing trend and/or exceed historic maximum concentrations? Do results indicate a potential risk to associated receptors including associated risks that PFAS may present towards receptors (i.e. human and ecological). Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts. 4. Has PFAS been detected in offsite surface water bodies within the management areas? If yes, do PFAS concentrations reported indicate an increasing trend or exceed historic maximum concentrations? Do results indicate a potential risk to receptors and changes to the risk profile? Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts. Annual Interpretative Report will review the results obtained against these triggers/decisions.
Specify Limits on Decision Error	The potential for significant decision errors will be minimised by completing a robust QA/QC program in accordance with DWER and NEPM guideline requirements. Standard operating procedures will be closely followed in the field to ensure accurate and representative data acquisition. DQIs will be applied to assess usability of data prior to making decisions, based on precision, accuracy, representativeness, comparability and completeness. The acceptable limit on decision error is 95% compliance with the applied DQIs (see Table 5-2). If any of the DQIs are not met, further assessment will be necessary to evaluate the significance of the non- conformance and any corrective actions.
Optimise the Design for Obtaining the Data	The design of the OMP has been made in consideration of historical activities at the site, historical investigations (and findings i.e. DSI and ERA), in the context of developing responses to the principal study questions outlined in Step 2 and to meet the DQOs ensuring that a representation of the current site condition can be achieved. The OMP scope for the 24 months of monitoring is outlined in Section 6. Following initial implementation (and review following each monitoring event), the available data will be reviewed and evaluated to determine if the frequency of monitoring should increase or decrease to provide better understanding of PFAS concentration fluctuations and potential risks to receptors. As additional information is gathered during the course of this investigation/monitoring, it may be beneficial for the proposed scope of works to be altered from the initial design. Changes to the proposed monitoring, if considered necessary, will be made based on risk profile reviews and updated CSM and in consultation with the Client Other factors that will optimise the design for obtaining data will include the use of laboratories that are NATA accredited for PFAS analysis and ensure laboratory LORs are suitable to meet the relevant adopted assessment levels (where possible), experienced field scientist(s), robust field and laboratory quality assurance/quality control protocols are adopted and Field and analytical data are collected in accordance with the PFAS NEMP (HEPA 2020), ASC NEPM (NEPC 2013) and the assessment of contaminated sites (DER 2014).

An assessment of the Data Quality Indicators (DQIs) relating to both field and laboratory procedures will be undertaken with appropriate documentation provided for each environmental element or media assessed. The DQIs adopted for the DSI are summarised in Table 5-2.

Table 5-2 Data Quality Indicators

<table>
<tr><th>Data Quality Indicator</th><th>Detail</th></tr>
<tr><td>QA Documentation</td><td>Provision of appropriate work plans, DQI and DQO defined for the site and all QA/QC aspects documented.</td></tr>
<tr><td>Bias</td><td>A measure of the potential distortion in an analysis which can result in errors in one direction (e.g. one laboratory consistently higher results or consistent poor spiked matrix recovery).
Bias will be assessed with reference to the analysis of spiked matrix samples (NEPC 1999b).</td></tr>
<tr><td>Representativeness</td><td>A qualitative measure of the confidence that data is representative of each medium present on the site. Use of appropriate and documented sampling methods, sampling handling, preservation and transport and holding times.</td></tr>
<tr><td>Precision:</td><td>A quantitative measure of data variability or reproducibility, measured by the calculation of %RPD values for duplicate samples (i.e. measure of agreement).
Precision in DQI is considered an important assessment in an environmental study (USEPA, 2002, Guidance on Environmental Data Verification and Data Validation). It can be measured as follows:
▪ Percentage of the mean of the measurement such as Relative Percent Difference (i.e. %RPD). The %RPD will be calculated for the field and secondary duplicate (i.e. inter and intra-laboratory analysis); and
▪ Use of similar analytical method and instrument (e.g. for inter-laboratory assessment).
The %RPD will be considered as acceptable if the values are:
<table>
<tr><th>Magnitude of result</th><th>Acceptable RPD range</th></tr>
<tr><td><10 x limited of reporting (LOR)</td><td>No limits</td></tr>
<tr><td>10 – 20 x LOR</td><td>0% - 50%</td></tr>
<tr><td>>20 x LOR</td><td>0% - 20%</td></tr>
</table>
▪ Should there be a result that is greater than acceptable RPD range, then a “review should be conducted of the cause (e.g. instrument calibration, appropriateness of method used)” (NEPC, 2013).
For the purpose of this OMP, field and secondary duplicates should be collected at a rate of 1 in 10 samples (HEPA 2020 and RPS, 2018c).</td></tr>
<tr><td>Accuracy</td><td>A quantitative measure of the closeness of data to a ‘true value’, measured by the analysis of spike, blank and laboratory control samples (LCS). The LCS consists of a standard reference material or a matrix of known concentration.
For the purpose of assessing accuracy it is required that at least one LCS for each process batch be analysed (NEPC, 2013).</td></tr>
<tr><td>Comparability</td><td>A qualitative measure of the confidence that data may be considered to be equivalent for each sampling and analytical event. By use of standard procedures, comparable methods, qualified personnel and review of sample integrity.</td></tr>
<tr><td>Completeness</td><td>A measure of the amount of usable data (expressed as a percentage - %) from a data collection activity, based on completeness of test program, overall QA/QC completeness and validity of data set.</td></tr>
</table>

6 Ongoing Monitoring Program

6.1 OMP SAQP History

The changes made to the OMP SAQP since the Rev1 are documented in **Error! Reference source not found.**.

Table 6-1 OMP SAQP History

SAQP Version	Date	Report Section	Changes	Justification
Rev 2	17/12/2019	-	Formatting and figures updates, minor changes.	Defence review
Rev 3	18/08/2020	7	Update of assessment criteria and reference to HEPA (2020).	New guideline (HEPA, 2020)
		6.3	Replacement of decommissioned groundwater bores MW247, MW250 and MW260 by newly installed MW516, MW517, MW518 (respectively). Replacement of destroyed bore MW262 by MW010.	Monitoring network updates.
Rev 4	10/03/2021	6.3	Table 6-4 'Wells construction details' added.	Defence review
		6	Methodology tables updates	
Rev 5	23/08/2021	Tables 6-5, 6-8, 6-9 & 6-10	Laboratory Testing (removal of some non-PFAS analytes for groundwater, surface water, porewater and sediment testing)	Defence review
Rev 6	09/03/2022	6.3	Replacement bore MW500 added for MW117	Monitoring network updates
Rev 7	11/08/2022	6	Damaged/destroyed monitoring wells removed from OMP monitoring locations.	Unable to sample these locations.

6.2 Management Area Description

HMAS Stirling Garden Island and the marine nearshore environment are referred to as the "Management Area" (RPS, 2018c). The Management Area boundaries are presented on Figure 2, Appendix A.

6.3 Groundwater Monitoring

6.3.1 Groundwater Monitoring Network

The groundwater monitoring network sampled as part of the previous investigations at the Site is summarised in Table 6-2.

Table 6-2 HMAS Stirling Groundwater Monitoring Network

Location	Screened aquifer	Well ID	Average Screen Interval (mBGL)
Demolition Ground	Superficial	MW137, MW139, MW141, MW142, MW147, MW149, MW272	3-6
Fire Training Area	Superficial	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128.	3-6
WWTP	Superficial	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195, MW196, MW197, MW199, MW200, MW202, MW203	No Log Available

Location	Screened aquifer	Well ID	Average Screen Interval (mBGL)
	Deep	MW195D	10 - 13
Helicopter Support Facility	Superficial	MW214S, MW215S, MW216S, MW217S, MW220S, MW224S, MW225S, MW226S, MW227S, MW228S, MW282S	4 - 7
AVCAT Storage and Fuel Farm	Superficial	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW247, MW248, MW249	No Log Available
	Deep	MW274D, MW291D	No Log Available
Fire Station, Flammable/ Hazardous Goods and Waste Storage, Ship Sullage	Superficial	MW250, MW255S, MW256S, MW257S, MW258S, MW259S, MW260, MW261S, MW262S	3 - 6
Dredged Sediments	Superficial	MW264, MW268, MW269	2.5 – 5.5
Accommodation Area	Superficial	MW288, MW289	2.7 – 6.7
Source: RPS DSI Table A (PRS, 2018b) and ESdat database			

The groundwater monitoring locations as part of the OMP monitoring are presented in Table 6-3, along with the rationale for the selection, and are shown on Figures 3A-E, Appendix A.

Table 6-3 OMP Groundwater Monitoring Locations

Area	Monitoring Well / Bore ID	Rationale
Fire Training Area (Figure 3C)	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	Confirmation of overall PFAS impact identified in the DSI (GHD, 2018). Assessment of overall changes in PFAS concentration in the source areas to provide temporal data on depletion of the source zone. Confirm the level of risk identified in the ERA.
Demolition Ground (Figure 3B)	MW139, MW141, MW142, MW147, MW149	
WWTP (Figure 3D)	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW196, MW197, MW199, MW200, MW202, MW203, MW195D, MW195S	
Accommodation Area (Figure 3D)	MW288, MW289	
Helicopter Support Facility (Figure 3F)	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	
Dredge Spoil / Careening Bay (Figure 3E)	MW268, MW269	
AVCAT Storage and Fuel Farm (Figure 3E)	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW516, MW249	
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage (Figure 3E)	MW255, MW256, MW257, MW258, MW259, MW261	

Construction details for the groundwater wells monitored as part of the OMP are provided in Table 6-4.

Table 6-4 OMP Groundwater Monitoring Wells Construction Details

Well ID	Date drilled	Easting[1]	Northing[1]	RL TOC (mAHD)	Depth (mbTOC)	Screen interval (mbTOC)
MW109	2017	375573.399	6436243.395	4.446	5.5	2.5 - 5.5
MW112	2008	375513.7	6436208.38	3.973	6.0	3.0 - 6.0
MW120	2017	375449.982	6436134.215	4.409	5.5	2.5 - 5.5
MW121	2008	375552.25	6436122.78	3.7	5.7	2.7 – 5.7
MW123	2017	375585.05	6436093.989	6.62	8.0	4.5 - 8.0
MW124	2017	375835.849	6436297.305	1.899	4.0	0.750 - 4.0
MW125	2017	375846.238	6436213.778	1.882	3.9	0.9 - 3.9
MW126	2017	375873.534	6436085.061	1.948	3.9	0.9 - 3.9
MW127	2017	375925.611	6435948.027	1.771	3.9	0.9 - 3.9
MW128	2017	375670.344	6436212.685	4.537	5.5	2.5 - 5.5
MW139	2009	374964.76	6440104.47	2.273	5.0	2.0 - 5.0
MW141	2009	375021.66	6440143.5	3.025	5.0	2.0 - 5.0
MW142	2017	375033.148	6440146.157	2.573	4.0	0.25 - 4.0
MW147	2009	375032.34	6440124.29	3.423	5.0	2.0 - 5.0
MW149	2017	375064.008	6440095.63	2.303	4.0	1.0 - 4.0
MW158*		375550.33	6435719.4	14.541	15.8	
MW161*		375133.59	6435570.74	17.225	18.13	
MW166*		375049.03	6435410.26	11.89	13.0	10.0 - 13.0
MW171	2008	375226.79	6435237.5	29.238	31.5	28.5 - 31.5
MW172*		375283.14	6435355.8	16.772	26	
MW173*		375430.81	6435284.52	10.08	11.11	
MW193	2009	375508.55	6435098.21	11.86	13.5	10.5 - 13.5
MW195S	2008	375735.25	6435293.18	4.571	6.5	3.5 - 6.5
MW195D	2008	375737.03	6435293.35	4.363	13.0	10.0 - 13.0
MW196*		375995.91	6435294.6	12.75	13.8	
MW197*		376173.35	6435289.71	2.28		
MW199*		376029.54	6435161.036	11.8		
MW200*		376257.05	6435163.648	2.07		
MW202*		376468.79	6434833.07	2.121		
MW203*		376155.58	6434834.12	10.855		
MW214	2017	375891.231	6432273.413	8.075	9.0	5.5 - 9.0
MW215	2017	375849.425	6431907.202	3.794	4.5	1.5 - 4.5
MW216	2017	376015.304	6432232.151	8.329	9.0	6.0 - 9.0
MW217	2017	376182.988	6432372.132	8.847	9.5	6.5 - 9.5
MW220*		376260.7742	6432333.207			
MW224	2017	376270.928	6432090.977	13.372	14.25	11.25 - 14.52
MW225	2017	376605.45	6431932.234	4.066	5.0	2.0 - 5.0
MW226	2017	376798.645	6432087.539	1.749	3.8	0.75 - 3.8
MW227	2017	376522.067	6432424.034	2.961	4.2	1.25 - 4.2

Well ID	Date drilled	Easting[1]	Northing[1]	RL TOC (mAHD)	Depth (mbTOC)	Screen interval (mbTOC)
MW228	2017	376443.972	6432563.872	2.23	3.75	0.75 - 3.75
MW233*		376680.16	6434320.8	3.705	4.968	
MW236*		376256.45	6434168.67	4.6442	5.66	
MW238*		376846.72	6434047.83	4.827		
MW239*		376897.75	6434047.61	4.03		
MW240*		376825.33	6433978.29	4.483	6.8	
MW242*		376976.09	6434000.26	3.539	4.76	
MW243*		376825.22	6433936.86	4.892	7.0	
MW245*		376918.69	6433941.94	4.551	5.65	
MW249	2017	377131.46	6433911.436	5.227	6.5	3.5 - 6.5
MW255	2017	376282.378	6433831.895	4.609	6.0	3.0 - 6.0
MW256	2017	376342.186	6433831.509	3.835	6.0	3.0 - 6.0
MW257		376331	6433783	3.806	5.7	2.7 - 5.7
MW258		376320	6433758	4.043	6.0	3.0 - 6.0
MW259		376344	6433757	3.8	5.5	2.5 - 5.5
MW261*		376708.09	6433728.72	3.858	6.0	3.0 - 6.0
MW264	2017	376489.703	6433743.883	4.806	6.0	3.0 - 6.0
MW268	2017	376478.133	6433571.27	4.056	5.5	2.5 - 5.5
MW269	2017	376550.817	6433619.688	4.153	5.5	2.5 - 5.5
MW282	2017	376070.828	6432003.232	5.78	7.5	4.5 - 7.5
MW288	2017	376735.953	6434566.951	4.003	5.25	2.25 - 5.25
MW289	2017	376599.58	6434490.565	4.495	6.25	3.25 - 6.25
MW500	2019	375548.49	6436184.17	3.692	6.5	2.0 – 6.5
MW516		376896.36	6433825.69	6.37	7.5	4.5 - 7.5

Notes:
1. MGA94 zone 50
RL – Relative Level
TOC – Top of Casing
* No bore log available

6.3.2 Monitoring Frequency

All groundwater monitoring locations listed in Table 6-3 will be sampled quarterly for 24 months. The main sampling events will be undertaken in March, June. September and December to record the concentration and extent of PFAS and determine any seasonal fluctuations or trends.

6.3.3 Groundwater Sampling Methodology

Groundwater monitoring will be undertaken by no purge HydraSleeve® method as detailed in Table 6-5.

Table 6-5 Groundwater Monitoring Wells – Sampling Method

Activity	Details
Well Gauging	Standing Water Level (SWL) will be gauged in each well prior to sampling using an interface probe. All wells will be measured against a specified mark at the top of the well casing. Gauging time will be recorded on field records. Snap gauging will be undertaken in each areas presented on Figure 3A to take in consideration the tide influence when inferring the groundwater contours.

Activity	Details
Groundwater Field Parameters	The field parameters will be recorded via a down-hole water quality meter (positioned within the mid screen interval) prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters will be recorded using a water quality meter: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature. Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement will be recorded on field data records. All field instruments (e.g. water quality meter) will be calibrated by the equipment supplier and daily readings of reference solutions (bump tests) completed to optimise the accuracy of the measurements taken.
Deployment and Retrieval of HydraSleeves	HydraSleeve will be deployed with top weight sample collection to begin at the lowest point. HydraSleeve sampling devices will be left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. Samples will be collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples will be discharged immediately (minimise changes in chemistry) via discharge tube. Following sampling, hydrasleeves will be deployed in preparation for the next OMP monitoring event using the same string for consistency (same depth of sampling i.e. within screen depth).
Alternative sampling methodology (hand bailing)	Disposable HDPE hand bailers, attached to a polypropylene string, will be used in the event that the water column isn't sufficient to fill the hydrasleeve. Purging of the well (i.e. removal of 3x well volumes) will be undertaken prior to sampling to ensure that a sample representative of the aquifer is taken.
Field Records	Field records will include the following information: ▪ Sampling time and date. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. ▪ Calibration and daily bump test records. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Decontamination procedure	Dedicated HydraSleeves will be used at each groundwater bore thus removing the need for decontamination. All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample will be labelled with the sample location, date, project identification number and sampler's initials. Samples will be collected directly in appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times will be undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). All holding times will comply with the requirements set out in "Australian Standard AS/NZS 5567.1:1998 and AS 4482.1".

Activity	Details
Laboratory Testing	▪ Full PFAS analytical suite (see Appendix B). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance)
Laboratory Testing – Quality Control	Groundwater QC samples will be collected at the following frequencies as detailed in the OMP (DoD, 2019): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples should be sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day per field personnel [collected off re-used sampling equipment (e.g. interface probe)]. ▪ Field blank samples at 1 per day per eskie.
Laboratory Accreditation and Limits of Reporting	All groundwater analysis will be undertaken by laboratories accredited by the NATA. ▪ Primary analysis will be undertaken by ALS Global Laboratories (Perth) ▪ Secondary analysis will be undertaken by Eurofins (Perth). Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.01 µg/L).

6.4 Porewater, Surface Water and Sediment Monitoring

6.4.1 Monitoring Locations

The surface water, porewater and sediment locations, sampled as part of the DSI (RPS, 2018b) are summarised in Table 6-6.

Table 6-6 Summary of Porewater Surface Water and Sediment Monitoring Locations (RPS, 2018b)

Location	Porewater Monitoring Location	Sediment Monitoring Location	Surface Water Monitoring locations
Fire Training Area	PW129, PW130, PW131, PW132, PW133, PW134, PW135, PW136	SD129, SD130, SD131, SD132, SD133, SD134, SD135, SD136	SW129, SW130, SW131, SW132, SW133, SW134, SW135, SW136
Demolition Ground	PW150, PW151, PW152, PW153, PW154, PW155, PW156, PW157	SD150, SD151, SD152, SD153, SD154, SD155, SD156, SD157	SW150, SW151, SW152, SW153, SW154, SW155, SW156, SW157
WWTP	PW204, PW205, PW206, PW207, PW208	SD159, SD162, SD165, SD168, SD187, SD189, SD190, SD192, SD204, SD205, SD206, SD207, SD208	SW160, SW167, SW175, SW178, SW181, SW188, SW191, SW204, SW205, SW206, SW207, SW208
Helicopter Support Facility	PW229, PW230, PW231, PW232	SD229, SD230, SD231, SD232	SW229, SW230, SW231, SW232
Dredged Sediments	PW270, PW271	SD270, SD271	SW270, SW271
Dredge Spoil / Careening Bay	PW374, PW375, PW378	SD374, SD375, SD378	SW317, SW318, SW319

The porewater and sediment co-located monitoring locations and surface water monitoring locations are presented in Table 6-7 along with the rationale for the selection, and are highlighted on Figures 3A-F, Appendix A.

Table 6-7 OMP Surface Water, Porewater and Sediment Monitoring Locations

Area	Surface water Sampling Location ID	Sediment Sampling Location ID	Porewater Sampling Location ID	Rationale
Fire Training Area (Figure 3C)	SW130, SW132, SW134	SD335, SD340, SD341, SD362, SD363, SD364	PW335, PW340, PW341, PW362, PW363, PW364	Monitoring of these locations will provide an indication of any change in the nature or magnitude of PFAS in surface water, porewater and sediments, and will help in determining changes attributable to seasonal fluctuations. Confirm the level of risk identified in the ERA.
Demolition Ground (Figure 3B)	SW150, SW152, SW154, SW156	SD329, SD330, SD331, SD356, SD357, SD358	PW329, PW330, PW331, PW356, PW357, PW358	
WWTP (Figure 3D)	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	
Accommodation Area (Figure 3D)		SD346	PW346	
Helicopter Support Facility (Figure 3F)	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	
Dredge Spoil / Careening Bay	SW317, SW318, SW319	SD374, SD375, SD378	PW374, PW375, PW378	

6.4.2 Surface Water, Porewater and Sediment Monitoring Frequency

The surface water, porewater and sediment monitoring locations listed in Section 6.4.1 will be sampled four times per year, in March, June, September and December to record the concentration and extent of PFAS and determine any seasonal fluctuations or trends.

This sampling should be conducted in conjunction with the groundwater monitoring described in Section 6.3

6.4.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 6-8.

Table 6-8 Surface Water Investigation Methodology

Item	Details
Field parameters	Surface water physiochemical parameters (i.e. pH, electrical conductivity (EC), oxidation reduction potential (ORP), dissolved oxygen (DO), and temperature) will be recorded at the time of sampling using a pre-calibrated water quality meter. Field observations such as odours or sheen presence must also be recorded on field sampling sheets.
Sampling Method	Surface water samples will be collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container will be positioned 10 cm below the surface water level and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples will be decanted into the laboratory supplied sample containers. Samples will be collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) '*Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'*.
Sample Collection	Water samples will be placed directly into appropriately labelled, laboratory supplied sample bottles and packed in chilled containers for delivery to the laboratory under Chain of Custody documentation.
Decontamination	All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	Each sample will be labelled with the sample location, date, project identification number and sampler's initials. Samples will be contained in appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times will be undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). ▪ All holding times will comply with the requirements set out in "Australian Standard AS/NZS 5567.1:1998 and AS 4482.1".
Field Records	Field records will include the following information: ▪ Sampling time and date. ▪ Weather conditions. ▪ Sample Collection method. ▪ Depth of water body and sample. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. ▪ Calibration records. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Laboratory Testing	Surface water samples will be analysed for the following: ▪ Full PFAS analytical suite (see Appendix B).

Item	Details
	▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride sulfate, alkalinity and ionic balance)
Laboratory Testing – Quality Control	Surface water QC samples will be collected at the following frequencies as detailed in the OMP: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples should be sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].
Laboratory Accreditation and Limits of Reporting	All surface water analysis will be undertaken by laboratories accredited by the NATA. ▪ Primary analysis will be undertaken by ALS Global Laboratories (Perth) ▪ Secondary analysis will be undertaken by Eurofins (Perth). Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.01 µg/L).

6.4.4 Sediment and Porewater Sampling Methodologies

The methodologies for sediment and porewater sampling are detailed in Table 6-9 and Table 6-10 respectively.

Table 6-9 Sediment Investigation Methodology

Item	Details
Sediment Sample Collection	Sediment samples will be collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under Chain of Custody documentation. At each sampling location, the sediment sample will be visually assessed and observations (including physical description) recorded on field data sheets.
Field Records	Field records will include the following information: ▪ Sampling time and date. ▪ Sample description and location characteristics. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Decontamination	All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Laboratory Testing	Sediment samples will be analysed for the following: ▪ Full PFAS analytical suite (see Appendix B).
Laboratory Testing – Quality Control	Sediment QC samples will be collected at the following frequencies as detailed in the OMP: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 20 sediment samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 20 sediment samples should be sent to a secondary laboratory.
Laboratory Accreditation and Limits of Reporting	All sediment analysis will be undertaken by laboratories accredited by the NATA. ▪ Primary analysis will be undertaken by ALS Global Laboratories (Perth) ▪ Secondary analysis will be undertaken by Eurofins (Perth). Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.005 mg/kg).

Table 6-10 Porewater Investigation Methodology

Item	Details
Porewater Sample Collection	Porewater sampling will be undertaken in accordance with the USEPA guidance *Operating Procedure Pore Water Sampling*. Porewater will be purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The pore water sampler will be inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water.
Field Records	Field records will include the following information: ▪ Sampling time and date. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Decontamination	All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection. Tubing will be replaced at each sampling location.
Laboratory Testing	Porewater samples will be analysed for the following: ▪ Full PFAS analytical suite (see Appendix B). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride sulfate, alkalinity and ionic balance)
Laboratory Testing – Quality Control	Porewater QC samples will be collected at the following frequencies as detailed in the OMP: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 porewater samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 porewater samples should be sent to a secondary laboratory.
Laboratory Accreditation and Limits of Reporting	All porewater analysis will be undertaken by laboratories accredited by the NATA. ▪ Primary analysis will be undertaken by ALS Global Laboratories (Perth) ▪ Secondary analysis will be undertaken by Eurofins (Perth). Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.01 µg/L).

7 Assessment Criteria

7.1 Groundwater, Porewater and Surface Water

The assessment levels adopted for groundwater, porewater and surface water in this OMP are based upon the Heads of Environmental Protection Authorities Australia and New Zealand PFAS National Environmental Management Plan 2.0 (NEMP; HEPA 2020) and finding of previous site assessment i.e. Detailed Site Investigation (DSI) (RPS, 2018b). The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 7-1.

Table 7-1 Criteria for Groundwater, Porewater and Surface Water

Receptor	Adopted Assessment Criteria
Ecological	**99% species protection level for Fresh Water and interim Marine Water:** ▪ PFOS – 0.00023* µg/L ▪ PFOA – 19 µg/L
Human Health	**Recreational Water:** ▪ PFOS + PFHxS – 2.0 µg/L ▪ PFOA – 10 µg/L **Drinking Water:** ▪ PFOS + PFHxS – 0.07 µg/L ▪ PFOA – 0.56 µg/L
*The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement. At a minimum, the LOR to be adopted is to be consistent with the LORs in the DSI (RPS, 2018b).	

7.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Criteria for sediment samples are consistent with those adopted for the DSI and ERA and are presented in Table 7-2.

Table 7-2 Criteria for Sediment

Receptor	Adopted Assessment Criteria
Ecosystems	**Ecological – direct exposure (interim guidelines)** ▪ PFOS – 1 mg/kg ▪ PFOA – 10 mg/kg
	Ecological – indirect exposure (interim guidelines) ▪ PFOS – 0.01 mg/kg
Human Health	**Commercial / industrial (on-base activities)** ▪ PFOS + PFHxS – 20 mg/kg ▪ PFOA – 50 mg/kg

8 Reporting

8.1 Factual Reporting

A factual report should be produced at the completion of each monitoring event that summarises the data and findings of each monitoring event. Each factual report will present the findings and contain the following information:

> Introduction

> Scope of work completed.

> Description of sampling methodologies used.

> Field observations (e.g. condition of monitoring wells, description of purged water) and water quality parameter measurements.

> Summary of any changes to the monitoring network condition that may affect data integrity, or require rectification works, and recommendations for repair, replacement of decommissioning of a location

> Evaluation of the applicability of adopted assessment levels.

> Review of the suitability of the data for assessment purposes (QA/QC evaluation).

> Summary tables presenting gauged groundwater and surface water levels.

> Presentation of inferred groundwater contours and inferred groundwater flow direction in a figure.

> Summary tables of analytical results in comparison to adopted assessment levels.

> Laboratory reports, Chain of Custody (CoC) documentation, field sampling records, data validation and QA/QC details, equipment calibration certificates and other relevant documentation.

In the event that further investigation, management and/or remediation are required, recommendations will be presented in a separate ‘technical memorandum’.

8.2 Interpretive Reporting

Upon completion of each year’s monitoring period an interpretative report will be prepared. As a minimum, each interpretative report should include the following:

> The factual information described in Section 8.1.

> Evidence of compliance with the requirements of the SAQP and meeting stated objectives of the OMP.

> Relevant figures depicting sampling locations and site-specific hydrogeological features.

> Laboratory results and analysis including comparison with relevant screening criteria as identified in each OMP.

> Graphs showing historical concentrations of PFOS, PFOA and PFOS plus PFHxS.

> Assessment and commentary on appropriate Quality Assurance/ Quality Control (QA/QC) procedures.

> A discussion of analytical results in relation to the following:

- Trends in PFAS concentrations, including an assessment of temporal changes and/or changes to the extent of PFAS impacts. Trends should be assessed using an appropriate statistical analysis approach (e.g. using Mann-Kendall or similar analysis), with a specified level of confidence based upon the number of monitoring rounds completed.
- Consideration, based on data trends, as to whether any of the existing remediation / management measures should be re-assessed, with a view to potential modification, supplementation or cessation.
- Assessment of whether changes to the CSM and/or risk assessment are required.
- Whether recalibration or changes to the groundwater model are required to provide a better understanding of the potential future extent of PFAS impact in groundwater.

- Based on the data obtained, an assessment of the OMP sampling requirements with a view to establishing whether:
  - The number of locations monitored could be reduced, such as where PFAS concentrations are stable and are considered to present a low risk to receptors.
  - Additional monitoring locations are required, including the installation of new monitoring wells or sampling of additional existing wells to provide better understanding of the nature, extent or magnitude of PFAS impacts in a particular portion of the Management Area.
  - The frequency of monitoring should increase or decrease to provide better understanding of PFAS concentration fluctuations and potential risks to receptors.
  - Monitoring of additional media should be included in the OMP.
- An overview of remedial works or construction and maintenance activities undertaken in the management area during the reporting period, which may impact the CSM
- A statement as to whether the risk profile has changed overall, or for any specific location at the Site, and a recommendation as to whether this should trigger an OMP and/or PMAP review, or other action.

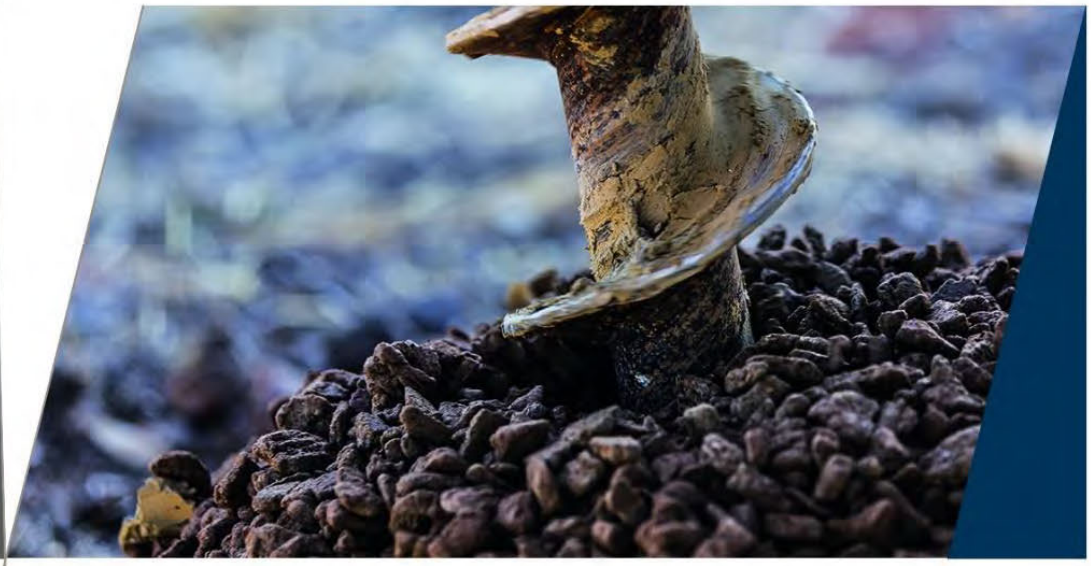
9 References

General References

1. Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds.
2. Australian Standard AS 4482-1999 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 2 – Volatile substances.
3. Australian and New Zealand Guidelines, 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.
4. Contaminated Sites Act 2003, Western Australia.
5. Department of Defence, Department of Energy, 2018, Quality System Manual Schedule B15.
6. Department of Water and Environmental Regulation (DWER), 2021, Assessment and Management of Contaminated Sites.
7. Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, PFAS National Environmental Management Plan 2.0 (NEMP).
8. National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013) (ASC NEPM).
9. National Health and Medical Research Council (NHMRC), August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.
10. Standards Australia 1998. AS/NZ 5667:1998 Water quality – sampling.
11. U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
12. USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.

Site Specific References

13. Department of Defence, January 2019, HMAS Stirling Garden Island PFAS Management Area Plan, Final.
14. RPS, October 2018, HMAS Stirling - PFAS Ongoing Monitoring Plan, Ref. EEC16094.005 (RPS, 2018a).
15. RPS, May 2018, Detailed Site Investigation – HMAS Stirling PFAS Investigation, Ref. EEC16094.003 (RPS, 2018b).
16. RPS, September 2018, HMAS Stirling Garden Island PFAS Investigation Ecological Risk Assessment. Ref. EEC16094.009 (RPS, 2018c).
17. GHD, September 2016, Jones Lang LaSalle. Defence PFAS Environmental Management Preliminary Sampling Program – HMAS Stirling (Garden Island)
18. GHD, October 2019, HMAS Stirling Stage 1 Preliminary Site Investigation.
19. GHD, June 2020, HMAS Stirling Stage 2 Detailed Site Investigation (Mobilisation 1).
20. Cardno, 16 April 2020, PFAS OMP 2019 Q4 Quarterly Monitoring Factual Report, HMAS Stirling
21. Cardno, 14 May 2020, PFAS OMP 2020 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling
22. Cardno, 23 September 2020, PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report
23. Cardno, 8 January 2020, PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report



APPENDIX

A

Figures



FIGURE 1

1:32,000 Scale at A3

Meters

0 500 1,000

Site Location

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2021-06-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 2

1:32,000 Scale at A3

Meters

0 500 1,000

Management Area

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2021-06-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002_ManagementArea 02.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

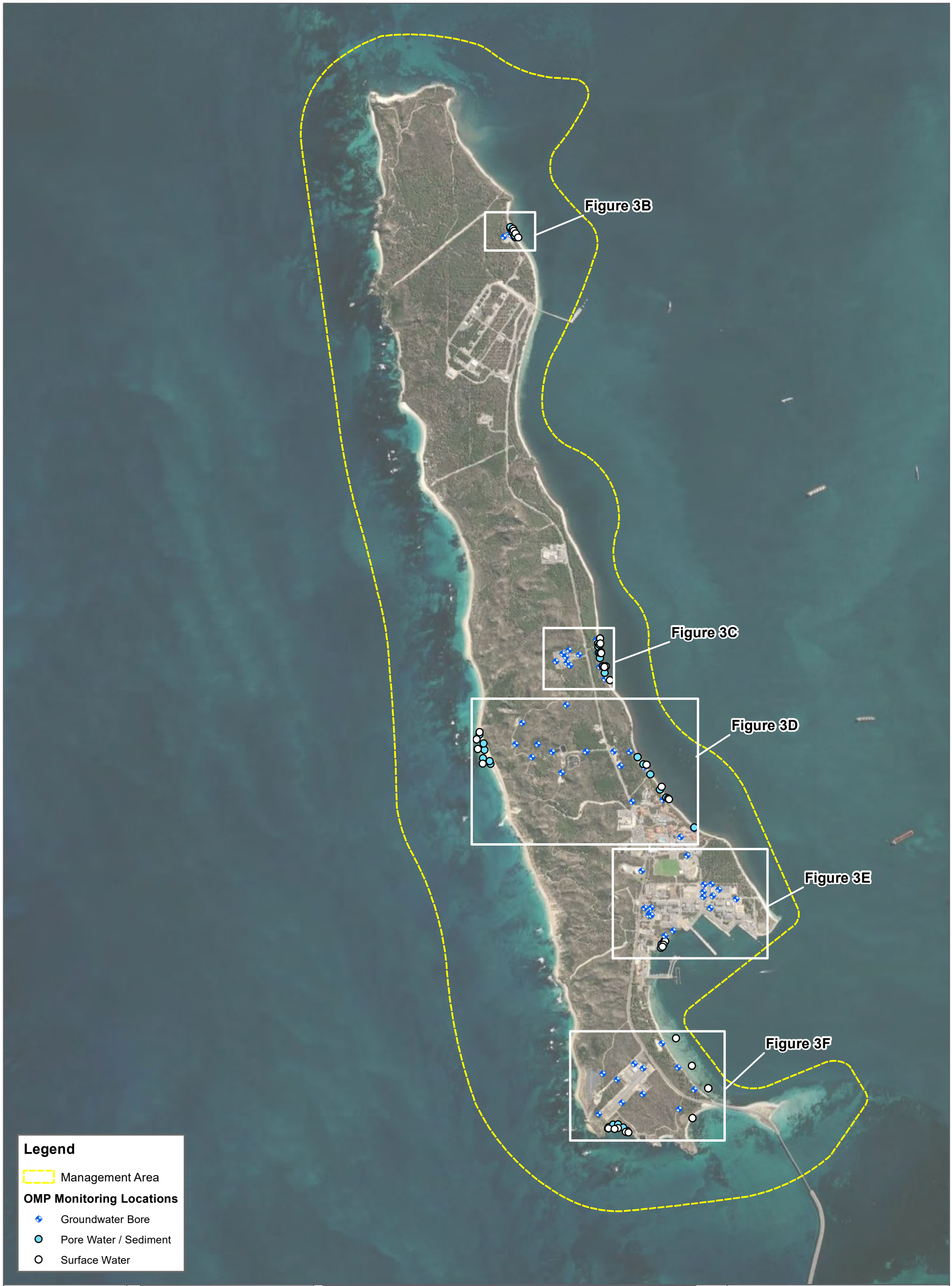


FIGURE 3A

1:32,000 Scale at A3

Meters

0 500 1,000

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-12-05 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_MonitoringLocations 03.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 3B

1:750 Scale at A3

Meters

0 25 50

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-12-05 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_DemolitionGroundLocations 03.mxd
Aerial Imagery Supplied by Nearmap



FIGURE 3C

1:2,000 Scale at A3

Meters

0 50 100

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-12-05 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003C_FireTrainingAreaLocations 03.mxd
Aerial Imagery Supplied by Nearmap

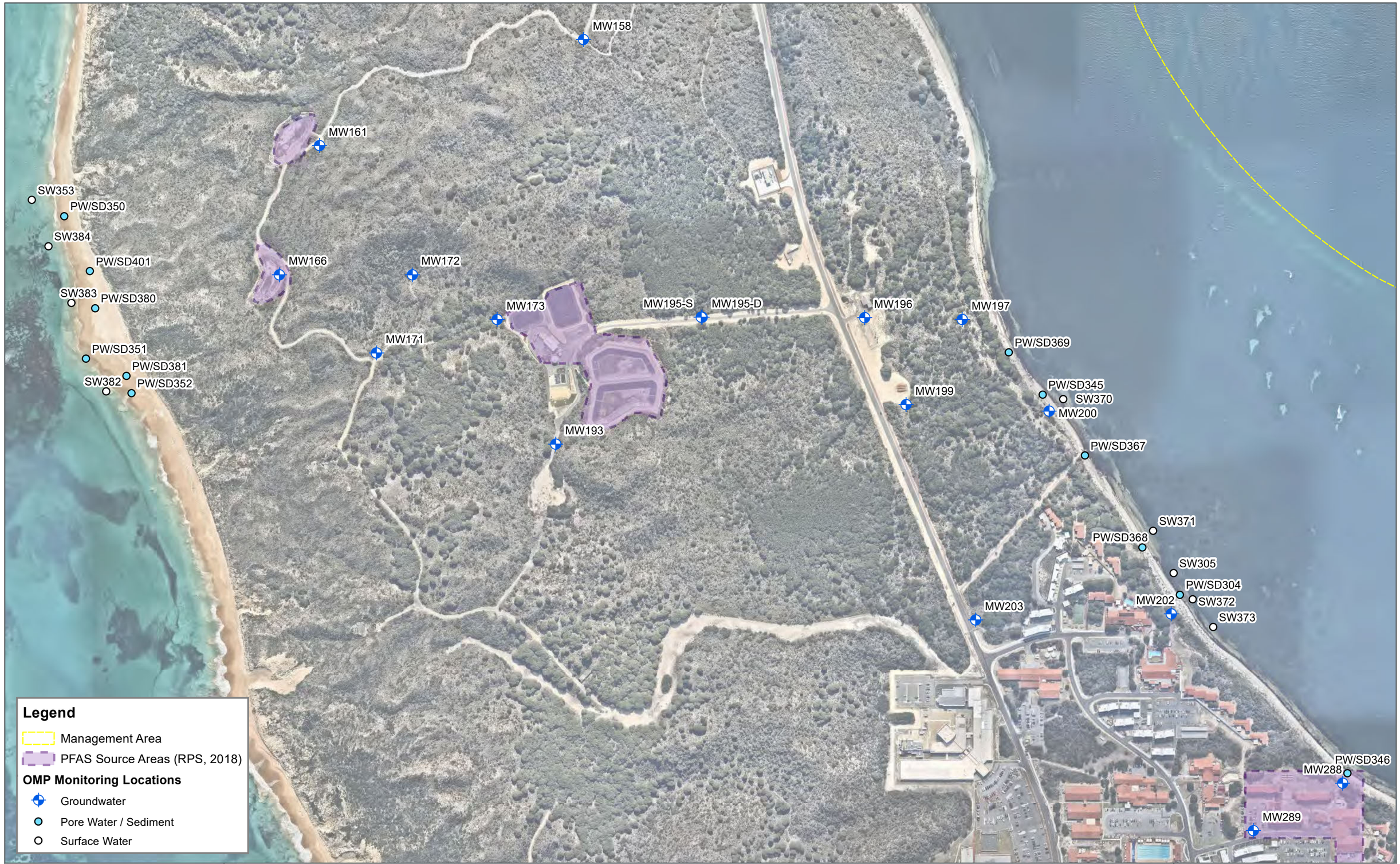


FIGURE 3D

1:5,500 Scale at A3

Meters

0 100 200

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2021-06-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003D_WWTPLocations 03.mxd
Aerial Imagery Supplied by Nearmap



FIGURE 3E

1:3,900 Scale at A3

Meters

0 100 200

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2022-12-05 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003E_MainBaseLocations 03.mxd
Aerial Imagery Supplied by Nearmap



FIGURE 3F

1:3,500 Scale at A3

Meters

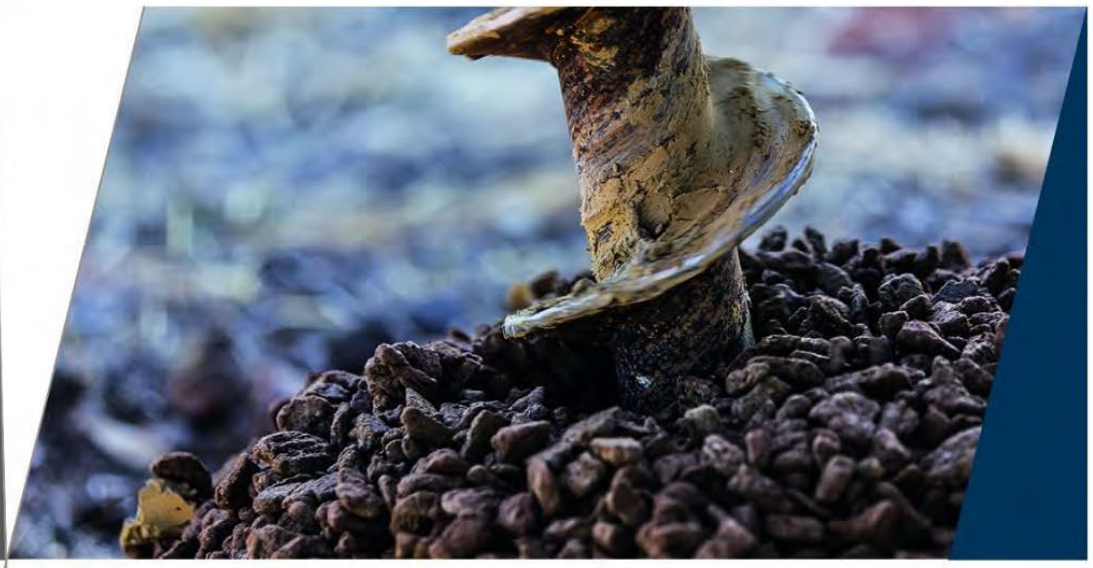
0 100 200

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2021-06-12 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003F_HSFLocations 03.mxd
Aerial Imagery Supplied by Nearmap



APPENDIX

B

Full PFAS Analytical Suite

Full PFAS Analytical Suite

Group	Analyte	CAS No.
Perfluoroalkane Sulfonic Acids	Perfluorobutane sulfonic acid (PFBS)	375-73-5
	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4
	Perfluorohexane sulfonic acid (PFHxS)	355-46-4
	Perfluoroheptane sulfonic acid (PFHpS)	375-92-8
	Perfluorooctane sulfonic acid (PFOS)	1763-23-1
	Perfluorodecane sulfonic acid (PFDS)	335-77-3
Perfluoroalkane Carboxylic Acids	Perfluorobutanoic acid (PFBA)	375-22-4
	Perfluoropentanoic acid (PFPeA)	2706-90-3
	Perfluorohexanoic acid (PFHxA)	307-24-4
	Perfluoroheptanoic acid (PFHpA)	375-85-9
	Perfluorooctanoic acid (PFOA)	335-67-1
	Perfluorononanoic acid (PFNA)	375-95-1
	Perfluorodecanoic acid (PFDA)	335-76-2
	Perfluoroundecanoic acid (PFUnDA)	2058-94-8
	Perfluorododecanoic acid (PFDoDA)	307-55-1
	Perfluorotridecanoic acid (PFTrDA)	72629-94-8
	Perfluorotetradecanoic acid (PFTeDA)	376-06-7
Perfluoroalkyl Sulfonamides	Perfluorooctane sulphonamide (FOSA)	754-91-6
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6
(n:2) Fluorotelomer Sulfonic Acids	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0



About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD

APPENDIX

C

FACTUAL REPORTS

Cardno

now

Stantec

PFAS OMP Quarterly Sampling Event Factual Report

January 2022

HMAS Stirling

DEF19009



Prepared for
Department of Defence

12 April 2022

Cardno®

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Version Number	Rev 2

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluoro-hexane Sulphonate
PFOA	Per-fluoro-octanoic Acid
PFOS	Per-fluoro-octane Sulfonate

Technical Terms

AFFF	Aqueous Film-Forming Foam
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
BGL	Below Ground Level
CEC	Cation Exchange Capacity
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
EC	Electrical Conductivity
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity - Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTG	Fire Training Ground
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

Cardno was engaged by the Australian Department of Defence ("the Client") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) at HMAS Stirling ("the site"). The site is located on Garden Island, Western Australia.

The OMP was carried out in accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP):

> Cardno, 23 August 2021, Reference: DEF19009, 'PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling'.

The SAQP was reviewed prior to the monitoring event and no changes were required.

For the purposes of this report:

> The Management Area was defined as comprising of Garden Island and the marine nearshore environment (Figure 1B, Appendix A).

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF).

The purpose of this PFAS OMP factual report is to provide an up-to-date status of the condition of the site as it is currently understood in relation to the most recent sampling event.

The objectives of the report are:

> To provide a succinct summary of the Q4 2021 sampling event and provision of analytical results with supporting tables and figures.

> To provide confirmation of the current understanding of risk.

> To provide supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

This assessment has been undertaken in general accordance with applicable industry standards for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

> National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013) (ASC NEPM).

> Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, PFAS National Environmental Management Plan (NEMP) 2.0.

> Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds.

> Standards Australia 1998. AS/NZ 5667:1998 Water quality – sampling.

> Australian and New Zealand Guidelines, 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

> Department of Water and Environmental Regulation (DWER), 2021, Assessment and Management of Contaminated Sites[1].

> Department of Defence, Department of Energy, 2018, Quality System Manual Schedule B15.

[1] It is noted that Site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-Site private properties and waterways.

> U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.

> USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.

> National Health and Medical Research Council (NHMRC), August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment.

2.1 Groundwater Monitoring

Sampling of selected groundwater bores was performed in general accordance with the SAQP (Cardno, 2021), applying methods set out in Section 3 of this report. The groundwater bores monitored as part of the OMP are presented in Table 2-1, and are shown on Figure 2, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID
Demolition Ground	MW137, MW139, MW141, MW142, MW147, MW149, MW272
Fire Training Area	MW109, MW112, MW117*, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128
Waste water treatment plant	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203,
Accommodation Area	MW288, MW289
Dredge Spoil / Careening Bay	MW264, MW268, MW269
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW516, MW248, MW249
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259, MW261, MW517, MW518, MW010
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282

Note: *Bore replaced by MW500

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2021), applying methods set out in Section 3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3 to 5, Appendix A.

Table 2-2 Porewater, Surface Water and Sediment Monitoring Locations

Monitoring Area	Porewater Sampling Location ID	Sediment Sampling Location ID	Surface Water Sampling Location ID
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	SD329, SD330, SD331, SD356, SD357, SD358	SW150, SW152, SW154, SW156
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	SD335, SD340, SD341, SD362, SD363, SD364	SW130, SW132, SW134
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384
Accommodation Area	PW346	SD346	
Dredge Spoil / Careening Bay	PW374, PW375, PW378	SD374, SD375, SD378	SW317, SW318, SW319
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416

2.3 Data Management

All the data included in the report has been collected, uploaded to the ESdat database and reviewed according to the data management requirements of the Defence Contamination Management Manual (DCMM Annex L).

The sample naming convention detailed in the DCMM Annex L was used in the field.

2.3.1 Defence ESdat database

Data collected as part of the Q4 2021 OMP monitoring event was uploaded to the ESdat database according to the data management requirements of the DCMM Annex L, including:

- All field data collected was uploaded;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q4 2021 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
All	Sampling period	Q4 monitoring event was postponed to January 2022 due to the Base Christmas shutdown. This is not considered to have impacted the results are sampling and weather conditions were similar to previous Q4 events. Q4 monitoring events have previously been undertaken across the December/January period.
MW109, MW128, MW147, MW158, MW172, MW173, MW197	Not sampled	These wells were found dry during this monitoring event. Limited impact – No data collected for Q4 2021 However most of these bores are seasonally dry and other bores are sampled nearby.
MW258	Not sampled	Bore blocked at 3.69 mBGL. Medium impact (no data collected) Repairs or replacement recommended.
MW137, MW264, MW272	Not sampled	These wells were not found. MW264 is assumed to have been destroyed by recent earthworks within the accommodation area and MW137 and MW272 are assumed to have been destroyed by recent storms which washed away the part of the beach. Medium impact – No data collected. Other bores are sampled

Location	Deviation	Comments/Impact
		nearby. Replacement recommended due to proximity with both a source area and sensitive receptor.
MW117	Bore missing	replaced by MW500. No impact.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was generally undertaken by no purge HydraSleeve® method as detailed in Table 3-1.

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	Standing Water Levels (SWL) were gauged using an interface probe. All wells were measured against a specified mark at the top of the well casing. Snap gauging was undertaken in each area presented on Figure 6 (Appendix A) to take in consideration tide influence. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater field parameters were recorded via a down-hole water quality meter (positioned within the mid screen interval) prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature. Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve	HydraSleeve were deployed with top weight for sample collection to begin at the lowest point. Following sampling, hydrasleeves were deployed in preparation for the next OMP monitoring event using the same string for consistency (same depth of sampling i.e. within screen depth).
Retrieval of HydraSleeves (Sample Collection)	HydraSleeve sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the hydrasleeve. Purging of the well was undertaken prior to sampling to make sure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume). A sample was collected once field parameters had stabilised.
Decontamination procedure	Dedicated HydraSleeves were used at each groundwater bore thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample was labelled with the sample location, date, project identification number and sampler's initials. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

Activity	Details
Quality Control	Groundwater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and Chain of Custody documentation are included in Appendix C.

3.2 Porewater and Sediment Sampling Methodology

The methodologies for sediment and porewater sampling are detailed in Table 3-2 and Table 3-3 respectively.

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 20 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 20 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the USEPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.

Item	Detail
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 3-4.

Table 3-4 Surface water Sampling Methodology

Item	Details
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature. Field observations such as odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container was positioned 10 cm below the surface water level where possible and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples were decanted into the laboratory supplied sample containers. Samples were collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) '*Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*'.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Surface water QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Surface water samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP:

> QA documentation.

> Bias.

- Data Representativeness.
- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability.
- Data Set Completeness.

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E. The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 3-5.

Table 3-5 Criteria for Groundwater, Porewater and Surface Water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health - Drinking Water Quality Guideline	0.07[1]	0.56	HEPA 2020
Human Health – Recreational Water	2[1]	10	NHMRC 2019
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only; The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement.

3.5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment will be assessed against the NEMP (HEPA, 2020) soil criteria for consistency with the SAQP (Cardno, 2021), DSI (RPS, 2018b) and ERA (RPS, 2018c). The adopted assessment criteria for sediments are detailed in Table 3-6.

Table 3-6 Criteria for Sediment

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	mg/kg		
Human Health - Commercial / industrial (on-base activities)	20[1]	50	HEPA 2020
Ecological - Direct exposure (interim guidelines)	1[2]	10	HEPA 2020
Ecological - Indirect exposure (interim guidelines) (on site)	0.01[2]	-	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only

4 Field Observations and Results

4.1 General Site Observations

No weather event that could have impacted the sampling or results obtained was observed. Major earthworks were observed within the accommodation area which prevented sampling of MW264 (presumed destroyed). This is not likely to have impacted the results obtained as part of this event. No dewatering activities were noted.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring event. Groundwater pH was near neutral to slightly alkaline, water was clear to brown in colour and fresh to saline. Groundwater temperature ranged from 19.9°C (MW124) to 26.2°C (MW288). DO readings mostly indicate aerobic groundwater condition. EC readings ranged from 332.6 µS/cm (MW500) to 43,258 µS/cm (MW126) and indicate fresh to highly-saline groundwater conditions. There was some olfactory evidence of contamination recorded, with a sulphur or fuel smell noted at several groundwater wells.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Appendix D. The groundwater elevations ranged between -0.065 mAHD (MW214) and 1.069 mAHD (MW120). It is expected that groundwater levels and migration are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours in discreet areas of the site. Groundwater flow was interpreted to be radial from the site (i.e. groundwater flows towards the ocean), following local topography, which is consistent with previous monitoring events. Groundwater inferred elevation contours and flow direction for the Q4 2021 monitoring event are shown in Figure 6, Appendix A.

4.2.2 Groundwater Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-1. Laboratory results have also been compared to available historical data in order to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figure 2 in Appendix A presents the groundwater monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW120, MW141, MW220, MW236, MW282, MW500	0.56[2]	13.1 (MW282)	58	6
Sum of PFHxS and PFOS	MW112, MW120, MW121, MW123, MW125, MW141, MW142, MW161, MW166, MW171, MW193, MW202, MW215, MW216, MW220 MW228, MW233, MW236, MW240, MW243, MW245, MW248, MW249, MW255, MW256, MW259, MW268, MW269, MW282, MW288, MW289, MW500, MW516	0.07[2]	201 (MW141)	58	33
PFOS	MW112, MW120, MW121, MW123, MW139, MW141, MW142, MW149, MW161, MW166, MW193, MW202, MW216, MW217, MW220, MW233, MW236, MW242, MW243, MW245,	0.01[3]	147 (MW141)	58	32

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
	MW248, MW249, MW255, MW256, MW257, MW259, MW269, MW282, MW288, MW289, MW500, MW516				

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the groundwater monitoring locations in Q4 2021.

4.3 Porewater

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring event. Porewater pH was near neutral, with a temperature oscillating between 14.9°C (PW329) and 20.6°C (PW308) (mean=16.82°C). Water was generally clear and EC/TDS readings indicate saline to highly-saline porewater conditions. DO readings mostly indicate aerobic porewater conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data. Figure 4 in Appendix A presents the porewater monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	0.02 (PW346)	39	0
Sum of PFHxS and PFOS	PW304, PW346, PW374	0.07[2]	2.09 (PW346)	39	3
PFOS	PW304, PW335, PW340, PW341, PW345, PW346, PW362, PW363, PW364, PW367, PW368, PW369, PW374	0.01[3]	1.84 (PW346)	39	13

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q4 2021.

4.4 Surface Water

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring event. Surface water pH was near neutral, temperature was 24.8°C on average, water was clear and EC readings (average of 54,943 µS/cm) indicate highly-saline conditions. DO readings (average 3.83 mg/L) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.4.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data. Figure 3 in Appendix A presents the surface water monitoring locations where a first time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-3 Summary of surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	28	0
Sum of PFHxS and PFOS	-	0.07[2]	0.06 (SW371)	28	0
PFOS	SW130, SW132, SW134, SW305, SW371, SW370, SW372, SW373	0.01[3]	0.06 (SW371)	28	8

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q4 2021.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling record sheets within Appendix D.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. Soil criteria are adopted in the absence of criteria for sediment for consistency with the SAQP (Cardno, 2021), DSI (RPS, 2018b) and ERA (RPS, 2018c). A summary of results is presented in Table 4-4. Laboratory results have also been compared to available historical data. Figure 5 in Appendix A presents the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-4 Summary of Sediment Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (mg/kg)	Max Conc. (mg/kg)	No. Analytical Results[4]	No. Results Above Criteria
PFOA	-	10[1]	<0.0002	39	0
Sum of PFHxS and PFOS	-	20[3]	0.0032 (SD346)	39	0
PFOS	-	0.01[2]	0.0029 (SD346)	39	0

Notes:

1. Ecosystems – open space – direct exposure
2. Ecological - indirect exposure
3. Human health – comm/industrial
4. Non-inclusive of quality control samples

Findings are summarised as follows:

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the sediment monitoring locations in Q4 2021.

4.6 Changes to the Monitoring Network Condition

The following changes to the monitoring network was observed:

> MW137, MW264 and MW272 were unable to be located at the time of sampling, it is presumed these bores have been destroyed.

No other change to the monitoring network that could have impacted the data integrity was recorded during the Q4 2021 monitoring event.

5 Summary and Conclusions

Cardno undertook the 2021 Q4 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Groundwater sampling and testing was undertaken at 58 monitoring bores, 28 surface water locations and 39 sediment and porewater co-located sampling locations. Eight (8) monitoring wells could not be sampled as the wells were found dry and three (3) wells were not found (assumed destroyed).

Groundwater levels were gauged in all wells before sampling. Groundwater flow was interpreted to be radial from the site where mounding of groundwater is occurring (i.e. groundwater flows towards the ocean), consistent with the previous monitoring events.

The groundwater laboratory results reported the following:

> Of the 58 samples that were tested, PFOA (6 samples), PFOS (32 samples) and Sum of PFHxS and PFOS (33 samples) reported concentrations that exceeded adopted assessment criteria.

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the groundwater monitoring locations.

The surface water laboratory results reported the following:

> Of the 28 samples tested, PFOS (8 samples) were reported above the adopted assessment criteria.

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values was reported for the surface water monitoring locations.

The porewater laboratory results reported the following:

> Of the 39 samples that were tested, PFOS (13 samples) and Sum of PFOS and PFHxS (3 samples) reported concentrations above adopted assessment criteria.

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations.

The sediment laboratory results reported the following:

> Of the 39 samples that were tested, no sampling locations reported a first time detection or concentrations above adopted assessment criteria.

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q1 2022), scheduled for March 2022. An Annual Interpretive Report will be prepared following the Q3 2022 monitoring event for the 2021 –2022 reporting period.

6 References

General References

1. Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds.
2. Australian Standard AS 4482-1999 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 2 – Volatile substances.
3. Australian Water Quality Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000).
4. *Contaminated Sites Act 2003*, Western Australia.
5. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement Technical Guidelines for the Estimation of Emissions by Facilities in Australia.
6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
8. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, '*Guidance on Environmental Data Verification and Data Validation'.*
9. The Heads of EPAs Australia and New Zealand (HEPA; 2020) PFAS National Environmental Management Plan (NEMP) 2.0, January 2020.
10. National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011 – updated 2018) National Water Quality Management Strategy Australian Drinking Water Guidelines 6, August 2018
12. NHMRC, August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.
13. Standards Australia/Standards New Zealand (1998) AS5667.1:1998 *'Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'*.
14. U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
15. USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.

Site Specific References

16. Department of Defence, January 2019, HMAS Stirling Garden Island PFAS Management Area Plan, Final.
17. Cardno, 23 August 2021, Reference: DEF19009, 'PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling'. Rev 5
18. Cardno, 16 April 2020, PFAS OMP 2019 Q4 Quarterly Monitoring Factual Report, HMAS Stirling
19. Cardno, 14 May 2020, PFAS OMP 2020 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling
20. Cardno, 23 September 2020, PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling
21. Cardno, 22 January 2021, PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report, HMAS Stirling
22. Cardno, March 2021, PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report, HMAS Stirling
23. Cardno, June 2021, PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling
24. Cardno, August 2021, PFAS OMP 2021 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling
25. Cardno, September 2021, PFAS OMP – 2020 Annual Interpretive Report, HMAS Stirling
26. Cardno, November 2021 PFAS OMP 2021 Q3 Quarterly Sampling Event Factual Report, HMAS Stirling

27. RPS, October 2018, HMAS Stirling - PFAS Ongoing Monitoring Plan, Ref. EEC16094.005 (RPS, 2018a).

28. RPS, May 2018, Detailed Site Investigation – HMAS Stirling PFAS Investigation, Ref. EEC16094.003 (RPS, 2018b).

29. RPS, September 2018, HMAS Stirling Garden Island PFAS Investigation Ecological Risk Assessment. Ref. EEC16094.009 (RPS, 2018c).

APPENDIX A

FIGURES



FIGURE 1A

1:32,000 Scale at A3

Meters

0 500 1,000

Site Location

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2021-07-26 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map

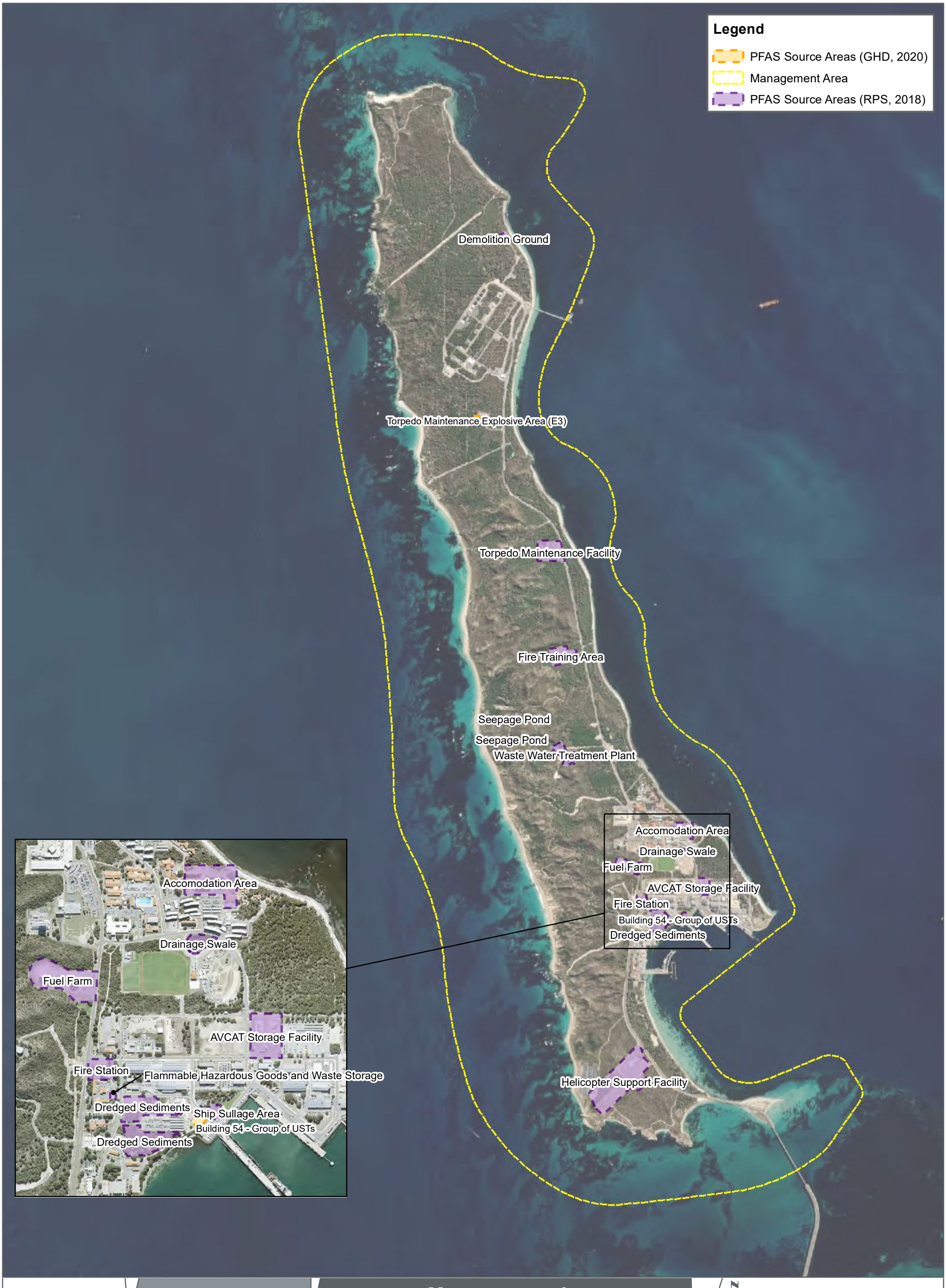


FIGURE 1B

1:32,000 Scale at A3

Meters

0 500 1,000

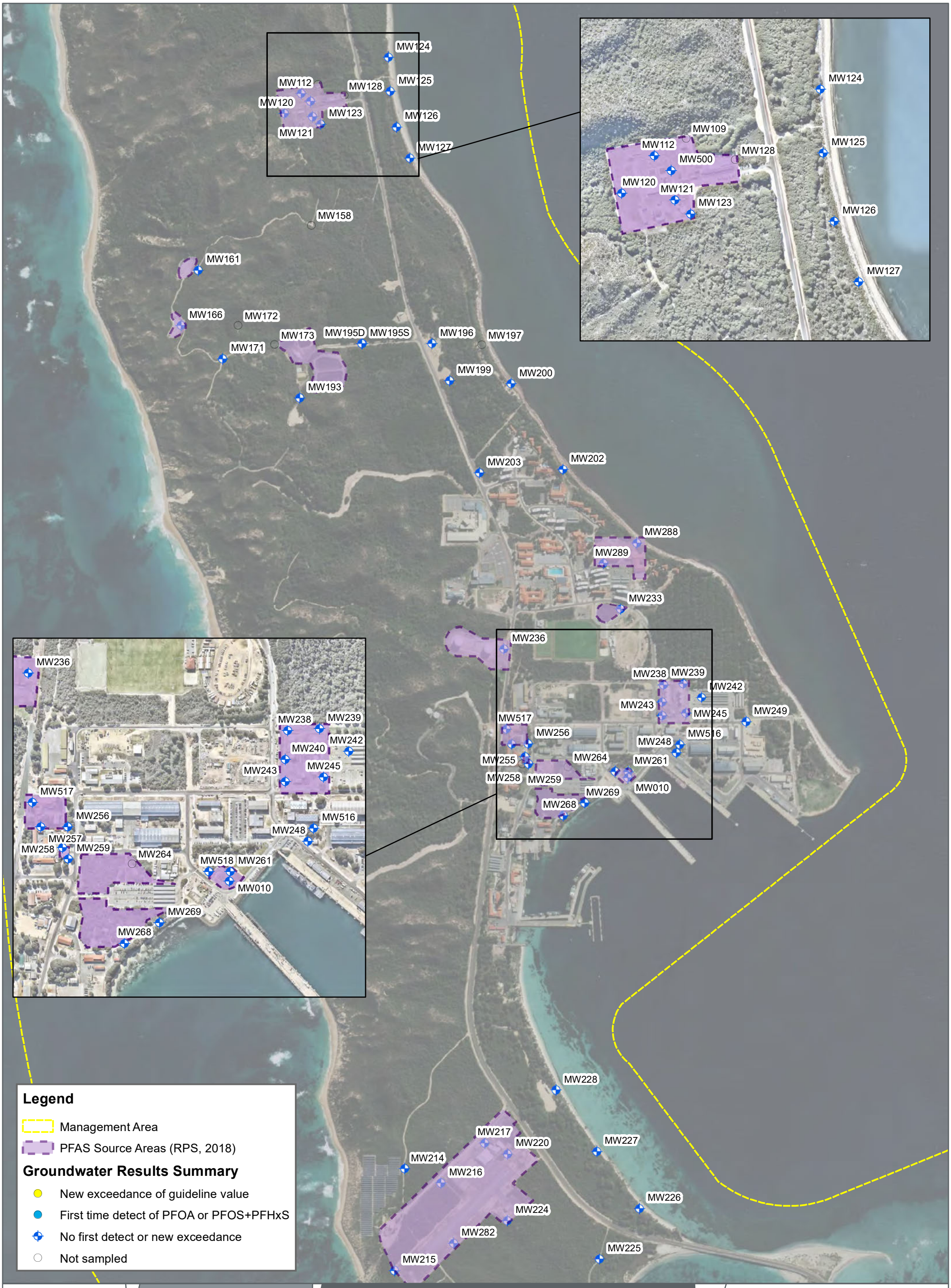
Management Area

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2021-07-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap


MW124
MW112
MW128
MW125
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MW126
MW121
MW127
MW158
MW161
MW166
MW172
MW173
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MW195S
MW196
MW197
MW171
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW243
MW245
MW249
MW517
MW256
MW516
MW248
MW255
MW264
MW261
MW258
MW259
MW010
MW269
MW268
MW257
MW518
MW228
MW217
MW220
MW227
MW214
MW216
MW226
MW224
MW282
MW225
MW215
MW109
MW500
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Results Summary
New exceedance of guideline value
First time detect of PFOA or PFOS+PFHxS
No first detect or new exceedance
Not sampled
FIGURE 2A
1:12,500 Scale at A3
Meters
0
300
600
Groundwater Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2021Q4_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

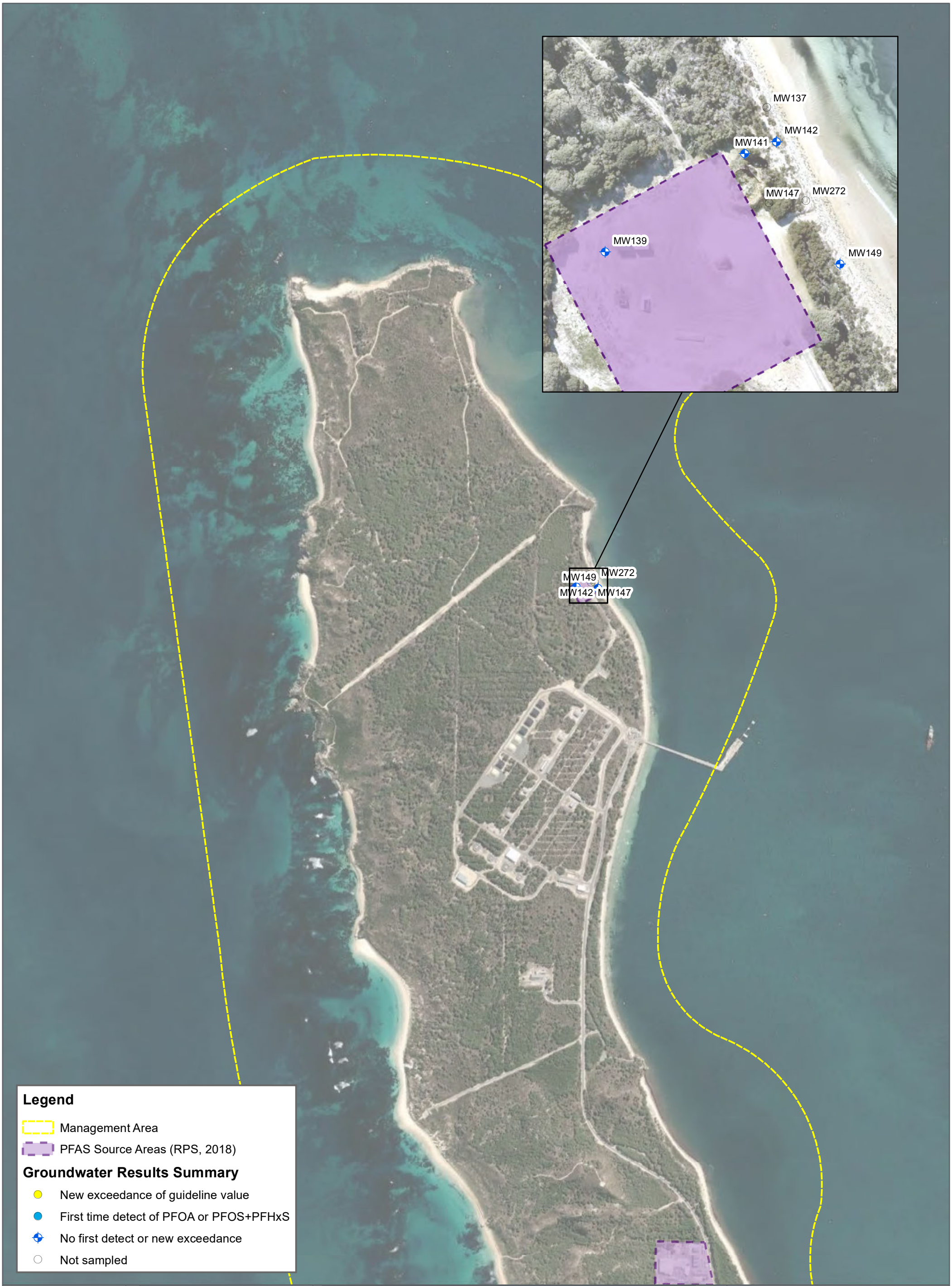


FIGURE 2B

1:15,000 Scale at A3

Groundwater Results

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2022-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002B_2021Q4_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

SW130
SW132
SW134
SW353
SW384
SW383
SW382
SW370
SW371
SW305
SW373
SW372
SW317
SW318
SW319
SW406
SW408
SW410
SW412
SW414
SW416
SW309
SW310
SW311

Legend

Management Area

Surface Water Results Summary

No first time detect or new exceedance

First time detect of PFOA or PFOS+PFHxS

New exceedance of guideline value

PFAS Source Areas (RPS, 2018)

FIGURE 3A

1:15,000 Scale at A3

Meters

0 300 600

Surface water Results

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_2021Q3_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap

SW150
SW152
SW154
SW156
SW150
SW156
SW154

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Surface Water Results Summary

- No first time detect or new exceedance
- First time detect of PFOA or PFOS+PFHxS
- New exceedance of guideline value

FIGURE 3B

1:15,000 Scale at A3

Meters

0 300 600

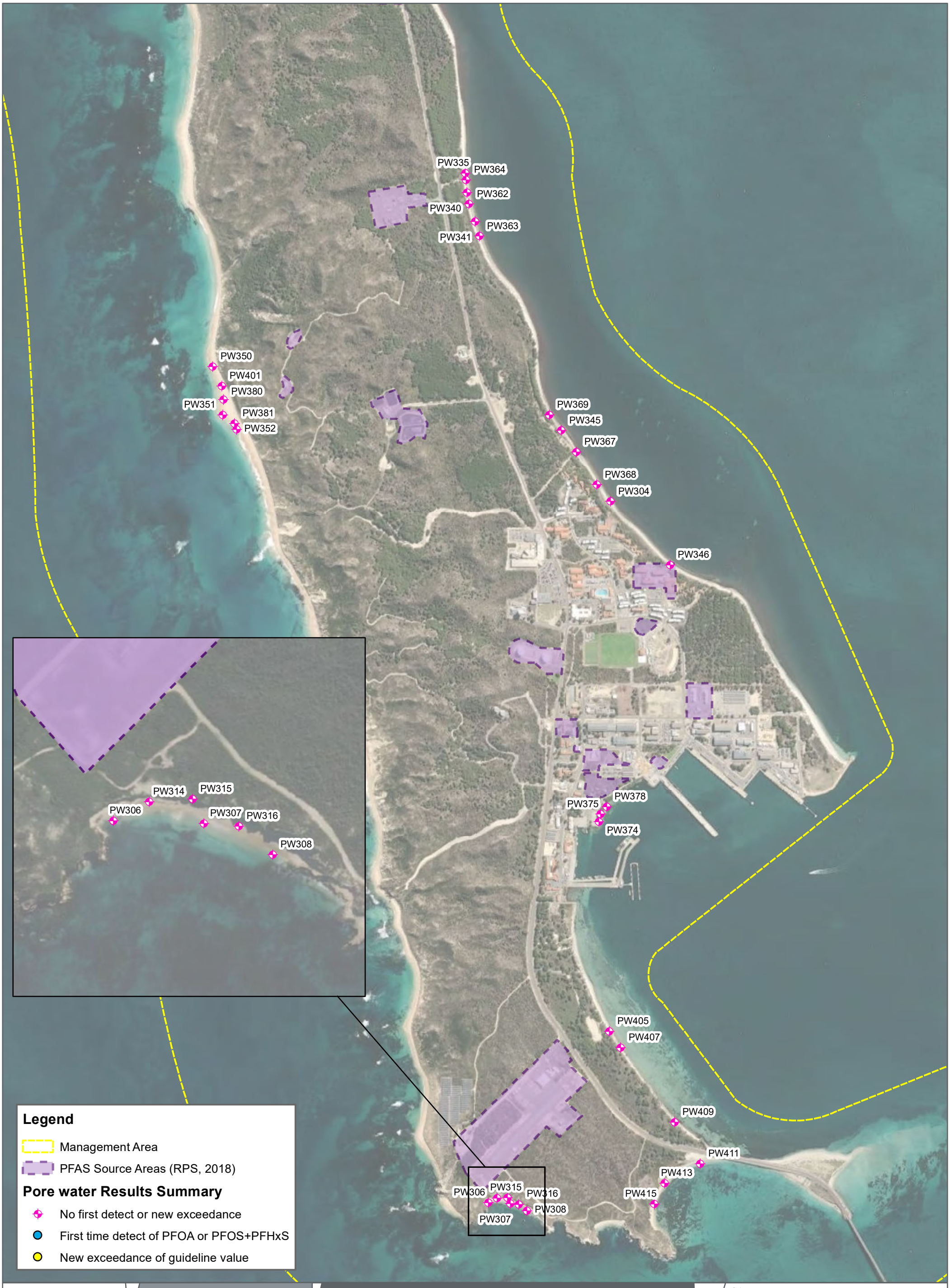
Surface water Results

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_2021Q4_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap


PW335
PW364
PW362
PW340
PW363
PW341
PW350
PW401
PW380
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PW381
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PW304
PW346
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PW411
PW413
PW415
PW306
PW315
PW316
PW308
PW307
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Pore water Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 4A
1:15,000 Scale at A3
Meters
0
300
600
Porewater Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004A_2021Q4_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 4B

1:15,000 Scale at A3

Meters

0 300 600

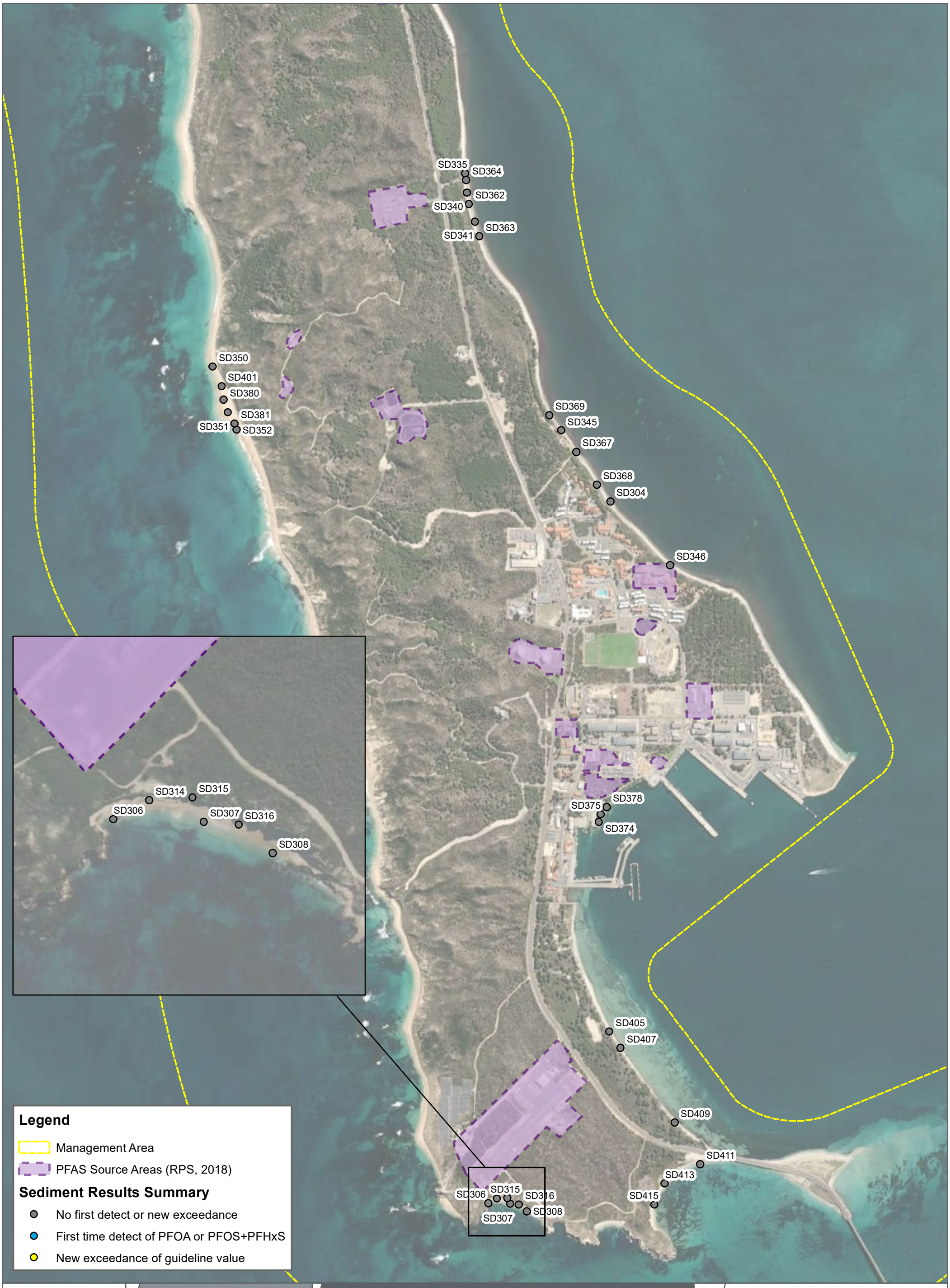
Porewater Results

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

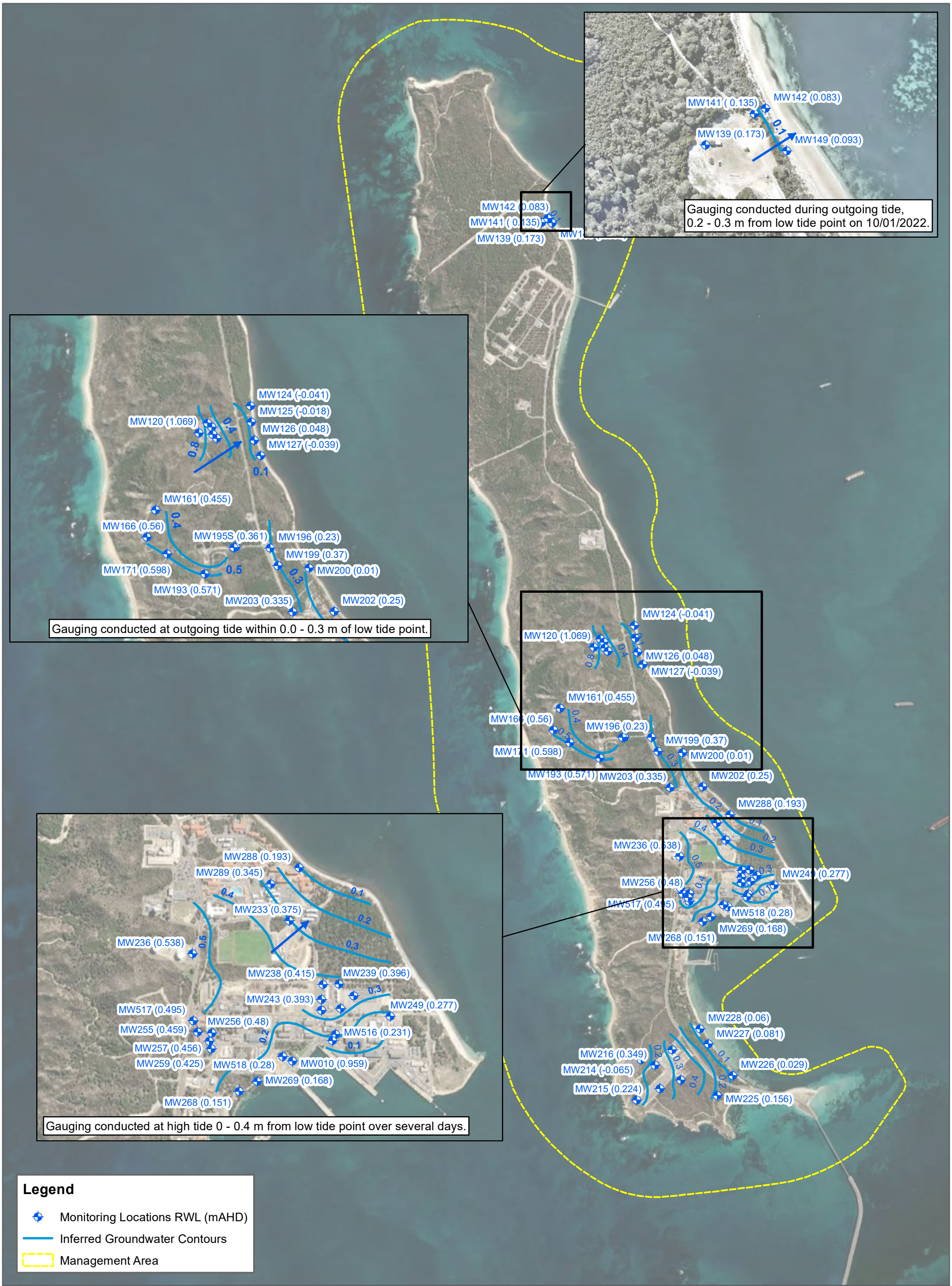
N

Cardno

Map Produced by Cardno WA
Date: 2022-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004B_2021Q3_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


SD335
SD364
SD362
SD340
SD363
SD341
SD350
SD401
SD380
SD381
SD351
SD352
SD369
SD345
SD367
SD368
SD304
SD346
SD314
SD315
SD306
SD307
SD316
SD308
SD375
SD378
SD374
SD405
SD407
SD409
SD411
SD413
SD415
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sediment Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 5A
1:15,000 Scale at A3
Meters
0
300
600
Sediment Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2021Q4_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth


SD356
SD331
SD357
SD330
SD358
SD329
SD356
SD358
SD357
SD329
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sediment Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 5B
1:15,000 Scale at A3
Meters
0
300
600
Sediment Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-02-01 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2021Q4_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


MW142 (0.083)
MW141 (0.135)
MW139 (0.173)
MW149 (0.093)
0.1
Gauging conducted during outgoing tide,
0.2 - 0.3 m from low tide point on 10/01/2022.
MW124 (-0.041)
MW125 (-0.018)
MW120 (1.069)
MW126 (0.048)
MW127 (-0.039)
MW161 (0.455)
MW166 (0.56)
MW195S (0.361)
MW196 (0.23)
MW199 (0.37)
MW171 (0.598)
MW200 (0.01)
MW193 (0.571)
MW203 (0.335)
MW202 (0.25)
Gauging conducted at outgoing tide within 0.0 - 0.3 m of low tide point.
MW288 (0.193)
MW289 (0.345)
MW233 (0.375)
MW236 (0.538)
MW238 (0.415)
MW239 (0.396)
MW243 (0.393)
MW249 (0.277)
MW517 (0.495)
MW256 (0.48)
MW255 (0.459)
MW516 (0.231)
MW257 (0.456)
MW259 (0.425)
MW518 (0.28)
MW010 (0.959)
MW269 (0.168)
MW268 (0.151)
Gauging conducted at high tide 0 - 0.4 m from low tide point over several days.
MW228 (0.06)
MW227 (0.081)
MW216 (0.349)
MW226 (0.029)
MW214 (-0.065)
MW215 (0.224)
MW225 (0.156)
Legend
Monitoring Locations RWL (mAHD)
Inferred Groundwater Contours
Management Area
FIGURE 6
1:32,000 Scale at A3
Meters
0
500
1,000
Inferred Groundwater Contours
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-02-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2021Q4_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

Cardno

Table B1 - Groundwater Analytical Results Summary

PFAS OMP Q4 2021 Monitoring Event
HMAS Stirling

				PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		Inorganics									Metals			
				Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting				0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water														*0.56*																			*0.07*													
PFAS NEMP 2020 Interim Marine 99%								0.00023						19																															
PFAS NEMP 2020 Recreational Water														**10**																			**2**													
Location Code	**Date**	**Field ID**	**Lab Report Number**																																											
MW010	**11/01/2022**	**0089_MW010_220111**	**EP2200241**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.01	0.01	<1	349	<1	349	12.3	10.4	124	8.43	87	83	15	10	109
MW112	**10/01/2022**	**0089_MW112_220110**	**EP2200214**	0.12	0.53	13.5	0.61	45.0	<0.02	0.2	0.38	2.52	0.92	*0.58*	0.07	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	0.67	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***58.5***	65.1	<1	226	<1	226	5.71	4.83	32	8.38	14	66	7	<1	22
MW120	**10/01/2022**	**0089_MW120_220110**	**EP2200214**	<0.02	0.05	12.7	4.29	1.05	<0.02	<0.1	<0.02	0.14	<0.02	*2.19*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***13.8***	20.4	<1	258	<1	258	7.05	6.10	51	7.26	22	72	15	2	28
MW121	**10/01/2022**	**0089_MW121_220110**	**EP2200214**	<0.02	<0.02	0.11	<0.02	0.22	<0.02	<0.1	<0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.33*	0.39	<1	257	<1	257	5.84	5.16	17	6.22	11	66	12	2	19
MW123	**10/01/2022**	**0089_MW123_220110**	**EP2200214**	0.14	0.09	0.33	<0.02	0.02	<0.02	<0.1	0.07	0.38	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.35*	1.03	<1	293	<1	293	8.15	7.32	77	5.33	6	75	15	1	54
MW124	**10/01/2022**	**0089_MW124_220110**	**EP2200216**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	536	<1	536	432	466	13,700	3.80	1,680	434	1,030	395	8,040
MW125	**10/01/2022**	**0089_MW125_220110**	**EP2200216**	0.20	0.17	0.63	<0.02	<0.01	<0.02	<0.1	0.02	0.20	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.63*	1.22	<1	382	<1	382	419	420	13,300	0.17	1,730	401	948	354	7,200
MW126	**10/01/2022**	**0089_MW126_220110**	**EP2200211**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.08	0.08	<1	639	<1	639	444	451	14,100	0.78	1,590	419	1,050	361	7,680
MW127	**10/01/2022**	**0089_MW127_220110**	**EP2200211**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	486	<1	486	383	391	12,100	1.08	1,530	364	931	315	6,630
MW139	**10/01/2022**	**0089_MW139_220110**	**EP2200214**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	147	<1	147	4.43	4.17	39	3.10	19	50	7	2	24
MW141	**10/01/2022**	**0089_MW141_220110**	**EP2200214**	1.18	4.12	53.7	2.68	147	<0.02	0.4	2.12	27.0	0.93	*3.97*	0.06	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.11	<0.05	<0.05	0.03	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***201***	243	<1	494	<1	494	218	204	6,790	3.46	825	337	412	141	3,440
MW142	**10/01/2022**	**0089_MW142_220110**	**EP2200214**	0.06	0.10	2.67	0.09	3.33	<0.02	<0.1	0.06	0.91	<0.02	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***6.00***	7.36	<1	434	<1	434	296	324	9,350	4.45	1,130	388	694	238	5,540
MW149	**10/01/2022**	**0089_MW149_220110**	**EP2200214**	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.06	0.06	<1	197	<1	197	*372*	366	11,800	0.80	1,700	298	799	336	6,370
MW161	**10/01/2022**	**0089_MW161_220110**	**EP2200216**	0.08	0.08	0.89	0.14	5.45	<0.02	<0.1	0.14	0.34	0.11	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***6.34***	7.33	<1	460	<1	460	30.6	25.2	654	9.69	145	84	82	32	310
MW166	**10/01/2022**	**0089_MW166_220110**	**EP2200211**	<0.02	0.42	0.04	0.97	0.16	7.06	<0.02	0.29	0.37	0.16	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***8.03***	9.14	<1	366	<1	366	36.6	31.3	924	7.74	155	112	79	35	422
MW171	**10/01/2022**	**0089_MW171_220110**	**EP2200216**	0.10	0.04	0.18	<0.02	<0.01	<0.02	<0.1	0.02	0.12	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.18*	0.46	<1	463	<1	463	154	142	4,740	4.14	552	192	340	111	2,340
MW193	**10/01/2022**	**0089_MW193_220110**	**EP2200211**	0.55	0.45	5.67	0.25	0.93	<0.02	0.1	0.20	1.28	0.09	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***6.60***	9.86	<1	493	<1	493	26.8	23.0	538	7.68	84	104	70	22	263
MW195D	**10/01/2022**	**0089_MW195D_220110**	**EP2200216**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	172	<1	172	363	327	11,600	5.28	1,560	379	752	261	5,500
MW195S	**10/01/2022**	**0089_MW195S_220110**	**EP2200216**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	595	<1	595	48.7	42.5	1,090	6.82	292	176	127	42	510
MW196	**13/01/2022**	**0089_MW196_220113**	**EP2200340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	207	<1	207	5.41	5.26	32	1.46	18	58	17	2	21
MW199	**10/01/2022**	**0089_MW199_220110**	**EP2200216**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	396	<1	396	72.2	67.3	2,110	3.54	229	106	139	54	1,130
MW200	**10/01/2022**	**0089_MW200_220110**	**EP2200216**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	411	<1	411	62.3	55.0	1,780	6.22	187	81	86	53	978
MW202	**12/01/2022**	**0089_MW202_220112**	**EP2200288**	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	<1	344	<1	344	13.8	12.4	198	5.20	64	93	28	12	119
MW203	**10/01/2022**	**0089_MW203_220110**	**EP2200216**	0.02	0.02	0.07	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.07	0.11	<1	302	<1	302	10.2	9.11	70	5.91	108	65	39	7	57
MW214	**13/01/2022**	**0089_MW214_220113**	**EP2200340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	375	<1	375	35.8	34.6	981	1.80	32	197	67	10	436
MW215	**13/01/2022**	**0089_MW215_220113**	**EP2200340**	0.04	0.06	0.47	<0.02	<0.01	<0.02	<0.1	0.04	0.13	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.47*	0.74	<1	290	<1	290	16.8	15.4	325	4.05	86	123	34	8	145
MW216	**13/01/2022**	**0089_MW216_220113**	**EP2200340**	0.62	0.56	4.98	0.18	1.20	<0.02	1.1	4.08	3.08	0.48	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	2.23	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***6.18***	18.8	<1	324	<1	324	20.8	19.5	446	3.01	82	148	49	5	184
MW217	**13/01/2022**	**0089_MW217_220113**	**EP2200339**	0.04	0.02	0.01	<0.02	0.04	<0.02	2.2	10.8	11.7	0.98	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	25.6	0.26	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.05	52.0	<1	261	<1	261	7.67	9.08	54	8.39	45	113	13	6	51
MW220	**13/01/2022**	**0089_MW220_220113**	**EP2200339**	0.58	0.27	5.45	0.69	72.0	<0.02	0.4	0.85	1.88	0.28	*0.64*	0.09	<0.02	<0.02	<0.02	<0.02	<0.05	0.07	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***77.4***	83.2	<1	359	<1	359	9.85	10.0	69	0.89	35	109	22	15	55
MW224	**13/01/2022**	**0089_MW224_220113**	**EP2200339**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	219	<1	219	8.55	8.55	120	<0.01	38	58	21	4	88
MW225	**13/01/2022**	**0089_MW225_220113**	**EP2200340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	399	<1	399	26.6	24.0	620	4.98	53	146	54	7	279
MW226	**13/01/2022**	**0089_MW226_220113**	**EP2200340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	664	<1	664	474	505	14,900	3.21	1,940	411	1,170	465	8,660
MW227	**14/01/2022**	**0089_MW227_220114**	**EP2200399**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	357	<1	357	35.2	32.7	834	3.63	217	116	71	25	470
MW228	**14/01/2022**	**0089_MW228_220114**	**EP2200399**	0.21	0.11	0.10	<0.02	<0.01	<0.02	2.0	8.90	12.0	2.42	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.27	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.10*	26.0	<1	549	<1	549	208	215	6,270	1.71	961	196	468	178	3,730
MW233	**10/01/2022**	**0089_MW233_220110**	**EP2200216**	<0.02	<0.02	0.01	<0.02	0.34	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.35*	0.35	<1	93	<1	93	3.55	3.01	57	8.23	4	37	4	2	18
MW236	**10/01/2022**	**0089_MW236_220110**	**EP2200211**	0.33	1.43	34.6	0.76	49.9	<0.02	0.1	0.21	1.93	0.84	*2.41*	3.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***84.5***	95.6	<1	259	<1	259	6.94	6.75	42	1.41	28	89	14	1	26
MW238	**12/01/2022**	**0089_MW238_220112**	**EP2200288**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	193	<1	193	5.84	6.31	41	3.86	40	81	14	3	24
MW239	**12/01/2022**	**0089_MW239_220112**	**EP2200288**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.01	0.01	<1	213	<1	213	6.06	5.73	28	2.82	49	75	13	2	20
MW240	**12/01/2022**	**0089_MW240_220112**	**EP2200288**	<0.02	<0.02	0.69	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.69*	0.75	<1	299	<1	299	8.68	7.67	53	6.15	58	108	12	3	28
MW242	**12/01/2022**	**0089_MW242_220112**	**EP2200288**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	194	<1	194	4.84	4.31	15	5.74	26	59	10	1	12
MW243	**12/01/2022**	**0089_MW243_220112**	**EP2200288**	<0.02	<0.02	0.07	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	<1	246	<1	246	7.15	7.85	55	4.63	33	106	14	4	30
MW245	**12/01/2022**	**0089_MW245_220112**	**EP2200288**	<0.02	<0.02	<0.01	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	<1	342	<1	342	7.79	6.75	34	7.19	<1	98	10	3	22
MW248	**12/01/2022**	**0089_MW248_220112**	**EP2200288**	0.13	0.10	1.07	0.06	1.38	<0.02	<0.1	0.04	0.38	0.04	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***2.45***	3.26	<1	524	<1	524	23.8	20.4	406	7.79	93	144	59	16	183
MW249	**12/01/2022**	**0089_MW249_220112**	**EP2200288**	<0.02	<0.02	0.15	<0.02	0.11	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.26*	0.30	<1	431	<1	431	12.8	11.0	118	7.68	40	85	36	7	82
MW255	**10/01/2022**	**0089_MW255_220110**	**EP2200211**	0.06	0.04	0.66	<0.02	0.40	<0.02	<0.1	0.02	0.11	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*1.06*	1.30	<1	270	<1	270	7.85	7.36	59	3.21	38	82	11	4	52
MW256	**10/01/2022**	**0089_MW256_220110**	**EP2200211**	0.67	0.57	4.99	0.32	8.18	<0.02	0.4	0.67	3.02	0.20	0.39	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.44	<0.05	<0.05	0.07	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	***13.2***	19.9	<1	377	<1	377	17.5	14.3	314	10.2	53	133	26	7	122
MW257	**10/01/2022**	**0089_MW257_220110**	**EP2200211**	<0.02	<0.02	0.03	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.04	0.04	<1	197	<1	197	5.47	4.94	39	5.12	21	61	7	4	28
MW259	**11/01/2022**	**0089_MW259_220111**	**EP2200241**	<0.02	<0.02	<0.01	<0.02	0.13	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	*0.13*	0.15	<1	170	<1	170	4.08	3.84	20	3.13	6	55	8	<1	10
MW261	**11/01/2022**	**0089_MW261_220111**	**EP2200241**	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.09	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.05	0.05	<1	337	<1	337	11.5	9.66	119	8.60	67	94	15	17	76
MW268	**11/01/2022**	**0089_MW268_220111**	**EP2200241**	0.07	0.07	0.41	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		Inorganics									Metals			
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting	0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water											*0.56*																			*0.07*														
PFAS NEMP 2020 Interim Marine 99%					0.00023						19																																	
PFAS NEMP 2020 Recreational Water											**10**																			**2**														
Location Code	**Date**	**Field ID**	**Lab Report Number**																																										
PW304	**11/01/2022**	**0089_PW304_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	<1	244	<1	244	626	648	20,000	1.73	2,720	432	1,420	527	11,400
PW306	**13/01/2022**	**0089_PW306_220113**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	137	<1	137	612	717	19,700	7.96	2,550	470	1,580	614	12,600
PW307	**13/01/2022**	**0089_PW307_220113**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	110	<1	110	616	685	19,900	5.24	2,540	447	1,520	596	12,000
PW308	**13/01/2022**	**0089_PW308_220113**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	113	<1	113	616	678	19,900	4.81	2,510	443	1,500	582	11,900
PW314	**13/01/2022**	**0089_PW314_220113**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	116	<1	116	623	674	20,100	3.92	2,580	444	1,500	585	11,800
PW315	**13/01/2022**	**0089_PW315_220113**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	113	<1	113	616	640	19,900	1.86	2,540	419	1,430	550	11,200
PW316	**13/01/2022**	**0089_PW316_220113**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	115	<1	115	610	668	19,700	4.54	2,500	436	1,490	578	11,700
PW329	**10/01/2022**	**0089_PW329_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	178	<1	178	708	719	22,800	0.78	2,940	467	1,530	513	12,800
PW330	**10/01/2022**	**0089_PW330_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	144	<1	144	680	763	21,900	5.78	2,850	490	1,620	550	13,600
PW331	**10/01/2022**	**0089_PW331_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	135	<1	135	672	720	21,700	3.46	2,750	469	1,540	524	12,800
PW335	**10/01/2022**	**0089_PW335_220110**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	**0.11**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.13	<1	114	<1	114	624	590	20,000	2.77	2,770	417	1,260	532	10,400
PW340	**10/01/2022**	**0089_PW340_220110**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	121	<1	121	623	629	20,000	0.51	2,700	445	1,330	577	11,100
PW341	**10/01/2022**	**0089_PW341_220110**	**EP2200212**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	102	<1	102	615	606	19,800	0.70	2,610	428	1,280	554	10,700
PW345	**10/01/2022**	**0089_PW345_220110**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	<1	446	<1	446	688	681	22,000	0.53	2,820	522	1,450	532	12,000
PW346	**12/01/2022**	**0089_PW346_220112**	**EP2200289**	0.04	0.03	0.25	<0.02	1.84	<0.02	<0.1	<0.02	0.05	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.09***	2.23	<1	307	<1	307	534	570	16,900	3.20	2,480	406	1,240	490	10,000
PW350	**11/01/2022**	**0089_PW350_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	112	<1	112	618	642	19,900	1.89	2,620	427	1,410	510	11,300
PW351	**11/01/2022**	**0089_PW351_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	119	<1	119	616	641	19,900	1.99	2,510	428	1,400	505	11,300
PW352	**11/01/2022**	**0089_PW352_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	115	<1	115	604	659	19,400	4.34	2,640	442	1,450	522	11,600
PW356	**10/01/2022**	**0089_PW356_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	165	<1	165	686	742	22,100	3.88	2,850	474	1,580	534	13,200
PW357	**10/01/2022**	**0089_PW357_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	120	<1	120	676	740	21,800	4.52	2,810	476	1,560	529	13,200
PW358	**10/01/2022**	**0089_PW358_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	148	<1	148	697	774	22,400	5.24	3,000	502	1,640	552	13,800
PW362	**10/01/2022**	**0089_PW362_220110**	**EP2200212**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	114	<1	114	642	622	20,600	1.56	2,810	430	1,310	563	11,000
PW363	**10/01/2022**	**0089_PW363_220110**	**EP2200212**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	113	<1	113	621	596	20,000	2.08	2,610	425	1,260	543	10,500
PW364	**10/01/2022**	**0089_PW364_220110**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	113	<1	113	628	607	20,200	1.70	2,690	429	1,290	551	10,700
PW367	**11/01/2022**	**0089-PW367_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	<1	718	<1	718	658	693	21,000	2.56	2,490	554	1,520	550	12,100
PW368	**11/01/2022**	**0089_PW368_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	<1	195	<1	195	278	277	8,810	0.22	1,240	206	623	226	4,820
PW369	**10/01/2022**	**0089_PW369_220110**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	<1	207	<1	207	665	651	21,300	1.04	2,880	485	1,380	519	11,500
PW374	**13/01/2022**	**0089_PW374_220113**	**EP2200343**	<0.02	<0.02	<0.01	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	<1	129	<1	129	612	686	19,700	5.72	2,560	455	1,530	593	12,000
PW375	**13/01/2022**	**0089_PW375_220113**	**EP2200343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	137	<1	137	574	638	18,700	5.32	2,090	428	1,410	536	11,200
PW378	**13/01/2022**	**0089_PW378_220113**	**EP2200343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	123	<1	123	614	718	19,800	7.81	2,570	481	1,590	612	12,600
PW380	**11/01/2022**	**0089_PW380_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	114	<1	114	606	659	19,500	4.13	2,600	430	1,450	522	11,600
PW381	**11/01/2022**	**0089_PW381_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	118	<1	118	615	626	19,800	0.87	2,600	420	1,380	499	11,000
PW401	**11/01/2022**	**0089_PW401_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	114	<1	114	615	642	19,800	2.11	2,620	426	1,410	510	11,300
PW405	**14/01/2022**	**0089_PW405_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	122	<1	122	626	663	20,100	2.93	2,700	457	1,470	588	11,600
PW407	**14/01/2022**	**0089_PW407_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	101	<1	101	633	664	20,400	2.38	2,690	457	1,480	593	11,600
PW409	**14/01/2022**	**0089_PW409_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	130	<1	130	631	654	20,300	1.81	2,660	460	1,460	584	11,400
PW411	**14/01/2022**	**0089_PW411_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	111	<1	111	635	630	20,500	0.44	2,630	436	1,400	558	11,000
PW413	**14/01/2022**	**0089_PW413_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	125	<1	125	654	676	21,100	1.63	2,710	472	1,500	607	11,800
PW415	**14/01/2022**	**0089_PW415_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	114	<1	114	641	630	20,700	0.85	2,650	436	1,410	558	11,000

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

				PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		Inorganics									Metals			
				Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting				0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water														*0.56*																			*0.07*													
PFAS NEMP 2020 Interim Marine 99%								0.00023						19																															
PFAS NEMP 2020 Recreational Water														**10**																			**2**													
Location Code	**Date**	**Field ID**	**Lab Report Number**																																											
SW130	**10/01/2022**	**0089_SW130_220110**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	128	<1	128	621	603	20,000	1.50	2,630	434	1,290	556	10,600
SW132	**10/01/2022**	**0089_SW132_220110**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.02	0.02	<1	127	<1	127	616	585	19,800	2.51	2,620	418	1,250	534	10,300
SW134	**10/01/2022**	**0089_SW134_220110**	**EP2200212**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.03	0.03	<1	126	<1	126	609	585	19,600	1.94	2,560	418	1,250	537	10,300
SW150	**10/01/2022**	**0089_SW150_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	120	<1	120	613	671	19,800	4.54	2,490	440	1,420	572	11,900
SW152	**10/01/2022**	**0089_SW152_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	138	<1	138	613	664	19,800	4.00	2,500	433	1,400	562	11,800
SW154	**10/01/2022**	**0089_SW154_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	120	<1	120	591	660	19,000	5.55	2,510	433	1,400	561	11,700
SW156	**10/01/2022**	**0089_SW156_220110**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	120	<1	120	602	712	19,500	8.34	2,400	464	1,500	513	12,700
SW305	**11/01/2022**	**0089_SW305_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.04	0.04	<1	132	<1	132	595	610	19,200	1.20	2,450	416	1,350	484	10,700
SW309	**13/01/2022**	**0089_SW309_220113**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	115	<1	115	614	656	19,800	3.31	2,570	433	1,460	563	11,500
SW310	**13/01/2022**	**0089_SW310_220113**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	120	<1	120	625	674	20,200	3.75	2,540	447	1,500	579	11,800
SW311	**13/01/2022**	**0089_SW311_220113**	**EP2200338**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	122	<1	122	614	667	19,800	4.16	2,550	441	1,480	574	11,700
SW317	**13/01/2022**	**0089_SW317_220113**	**EP2200343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	122	<1	122	607	712	19,900	7.97	2,060	466	1,570	608	12,500
SW318	**13/01/2022**	**0089_SW318_220113**	**EP2200343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	125	<1	125	611	672	19,800	4.74	2,400	445	1,480	569	11,800
SW319	**13/01/2022**	**0089_SW319_220113**	**EP2200343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	122	<1	122	620	669	20,000	3.84	2,550	452	1,500	559	11,700
SW371	**11/01/2022**	**0089_SW321_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.06	0.06	<1	127	<1	127	592	637	19,000	3.68	2,550	430	1,400	505	11,200
SW353	**11/01/2022**	**0089_SW353_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	121	<1	121	611	631	19,700	1.59	2,560	424	1,390	500	11,100
SW370	**10/01/2022**	**0089_SW370_220110**	**EP2200215**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.04	0.04	<1	128	<1	128	609	591	19,600	1.53	2,580	421	1,260	535	10,400
SW372	**12/01/2022**	**0089_SW372_220112**	**EP2200289**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.03	0.03	<1	120	<1	120	610	718	19,600	8.17	2,610	515	1,570	594	12,600
SW373	**12/01/2022**	**0089_SW373_220112**	**EP2200289**	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	0.05	0.05	5	117	<1	122			19,500		2,650	484	1,490	562	11,800
SW382	**11/01/2022**	**0089_SW382_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	115	<1	115	615	637	19,800	1.75	2,590	429	1,400	505	11,200
SW383	**11/01/2022**	**0089_SW383_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	120	<1	120	615	653	19,800	3.02	2,590	438	1,430	522	11,500
SW384	**11/01/2022**	**0089_SW384_220111**	**EP2200240**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	119	<1	119	608	626	19,500	1.46	2,660	421	1,380	498	11,000
SW406	**14/01/2022**	**0089_SW406_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	126	<1	126	621	658	20,000	2.87	2,630	459	1,460	582	11,500
SW408	**14/01/2022**	**0089_SW408_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	124	<1	124	621	648	20,000	2.17	2,600	455	1,450	578	11,300
SW410	**14/01/2022**	**0089_SW410_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	126	<1	126	636	647	20,500	0.92	2,630	452	1,440	576	11,300
SW412	**14/01/2022**	**0089_SW412_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	119	<1	119	645	658	20,800	1.04	2,670	456	1,460	589	11,500
SW414	**14/01/2022**	**0089_SW414_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	121	<1	121	630	642	20,300	0.88	2,660	446	1,430	569	11,200
SW416	**14/01/2022**	**0089_SW416_220114**	**EP2200400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<1	120	<1	120	627	647	20,200	1.59	2,640	454	1,440	578	11,300

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

Cardno

Table B4 - Sediment Analytical Results Summary

PFAS OMP Q4 2021 Monitoring Event
HMAS Stirling

				PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids												PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS	
				Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting				0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002
PFAS NEMP 2020 Ecological direct exposure								*1*						*10*																			
PFAS NEMP 2020 Ecological indirect exposure								0.01																									
PFAS NEMP 2020 Industrial/ commercial (HIL D)														**50**																			**20**	
Location Code	**Date**	**Field ID**	**Lab Report Number**																														
SD304	**11/01/2022**	**0089_SD304_220111**	**EP2200242**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD306	**13/01/2022**	**0089_SD306_220113**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD307	**13/01/2022**	**0089_SD307_220113**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD308	**13/01/2022**	**0089_SD308_220113**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD314	**13/01/2022**	**0089_SD314_220113**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD315	**13/01/2022**	**0089_SD315_220113**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD316	**13/01/2022**	**0089_SD316_220113**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD329	**10/01/2022**	**0089_SD329_220110**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD330	**10/01/2022**	**0089_SD330_220110**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD331	**10/01/2022**	**0089_SD331_220110**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD335	**10/01/2022**	**0089_SD335_220110**	**EP2200217**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD340	**10/01/2022**	**0089_SD340_220110**	**EP2200217**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD341	**10/01/2022**	**0089_SD341_220110**	**EP2200213**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD345	**10/01/2022**	**0089_SD345_220110**	**EP2200217**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD346	**12/01/2022**	**0089_SD346_220112**	**EP2200290**	<0.0002	<0.0002	0.0003	<0.0002	0.0029	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0032	0.0032
SD350	**11/01/2022**	**0089_SD350_220111**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD351	**11/01/2022**	**0089_SD351_220111**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD352	**11/01/2022**	**0089_SD352_220111**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD356	**10/01/2022**	**0089_SD356_220110**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD357	**10/01/2022**	**0089_SD357_220110**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD358	**10/01/2022**	**0089_SD358_220110**	**EP2200219**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD362	**10/01/2022**	**0089_SD362_220110**	**EP2200213**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD363	**10/01/2022**	**0089_SD363_220110**	**EP2200213**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD364	**10/01/2022**	**0089_SD364_220110**	**EP2200217**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD367	**11/01/2022**	**0089_SD367_220111**	**EP2200242**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004
SD368	**11/01/2022**	**0089_SD368_220111**	**EP2200242**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004
SD369	**10/01/2022**	**0089_SD369_220110**	**EP2200217**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD374	**13/01/2022**	**0089_SD374_220113**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD375	**13/01/2022**	**0089_SD375_220113**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002
SD378	**13/01/2022**	**0089_SD378_220113**	**EP2200341**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD380	**11/01/2022**	**0089_SD380_220111**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD381	**11/01/2022**	**0089_SD381_220111**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD401	**11/01/2022**	**0089_SD401_220111**	**EP2200279**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002
SD405	**14/01/2022**	**0089_SD405_220114**	**EP2200401**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD407	**14/01/2022**	**0089_SD407_220114**	**EP2200401**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD409	**14/01/2022**	**0089_SD409_220114**	**EP2200401**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD411	**14/01/2022**	**0089_SD411_220114**	**EP2200401**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD413	**14/01/2022**	**0089_SD413_220114**	**EP2200401**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002
SD415	**14/01/2022**	**0089_SD415_220114**	**EP2200401**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS	
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01
PFAS NEMP 2020 Drinking Water											*0.56*																		*0.07*	
PFAS NEMP 2020 Interim Marine 99%					0.00023						19																			
PFAS NEMP 2020 Recreational Water											**10**																		**2**	
Date	**Field ID**	**Sample Type**	**Lab Report Number**																												
10/01/2022	**0089_QC301_220110**	**Rinsate**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
10/01/2022	**0089_QC302_220110**	**Rinsate**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
10/01/2022	**0089_QC303_220110**	**Rinsate**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
10/01/2022	**0089_QC401_220110**	**Field Blank**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
10/01/2022	**0089_QC402_220110**	**Field Blank**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
10/01/2022	**0089_QC403_220110**	**Field Blank**	**EP2200218**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
11/01/2022	**0089_QC301_220111**	**Rinsate**	**EP2200241**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
11/01/2022	**0089_QC302_220111**	**Rinsate**	**EP2200241**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
11/01/2022	**0089_QC401_220111**	**Field Blank**	**EP2200241**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
11/01/2022	**0089_QC402_220111**	**Field Blank**	**EP2200241**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
12/01/2022	**0089_QC301_220112**	**Rinsate**	**EP2200288**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
12/01/2022	**0089_QC401_220112**	**Field Blank**	**EP2200288**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
13/01/2022	**0089_QC301_220113**	**Rinsate**	**EP2200339**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
13/01/2022	**0089_QC302_220113**	**Rinsate**	**EP2200339**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
13/01/2022	**0089_QC401_220113**	**Field Blank**	**EP2200339**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
13/01/2022	**0089_QC402_220113**	**Field Blank**	**EP2200339**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
14/01/2022	**0089_QC301_220114**	**Rinsate**	**EP2200399**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
14/01/2022	**0089_QC401_220114**	**Field Blank**	**EP2200399**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

	Date		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		
	Field ID		0089_SW134_220110	0089_QC102_220110		0089_SW134_220110	0089_QC202_220110		0089_MW123_220110	0089_QC101_220110		0089_MW123_220110	0089_QC201_220110		0089_MW120_220110	0089_QC104_220110		
	Matrix Type		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water		
	Lab Report Number		EP2200212	EP2200212	RPD	EP2200212	854607	RPD	EP2200214	EP2200214	RPD	EP2200214	854607	RPD	EP2200214	EP2200214	RPD	
		Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																		
	Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01				<0.01						0.03					
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.14	0.14	0	0.14	0.09	43	<0.02	<0.02	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.09	0.08	12	0.09	0.08	12	0.05	0.06	18
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.33	0.30	10	0.33	0.18	**59**	12.7	13.6	7
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	4.29	3.75	13
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.03	0.03	0	0.03	0.03	0	0.02	0.02	0	0.02	0.02	0	1.05	1.04	1
	Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01				
	Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																		
	Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
	Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.07	0.07	0	0.07	0.05	33	<0.02	<0.02	0
	Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.38	0.37	3	0.38	0.19	**67**	0.14	0.14	0
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
	Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	2.19	2.14	2
	Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																		
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																		
	Sum of PFHxS and PFOS	µg/L	0.01	0.03	0.03	0	0.03	0.03	0	0.35	0.32	9	0.35	0.2	**55**	13.8	14.6	6
	Sum of PFAS	µg/L	0.01	0.03	0.03	0	0.03	<0.1	0	1.03	0.98	5	1.03	0.64	**47**	20.4	20.7	1
	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01					0.03						0.2				
Inorganics																		
	Carbonate Alkalinity (as CaCO3)	mg/L	1	<1			<1			<1			<1			<1		
	Alkalinity (Bicarbonate as CaCO3)	mg/L	1	126			126			293			293			258		
	Alkalinity (Hydroxide) as CaCO3	mg/L	1	<1			<1			<1			<1			<1		
	Alkalinity (total) as CaCO3	mg/L	1	126			126			293			293			258		
	Anions Total	meq/L	0.01	609			609			8.15			8.15			7.05		
	Cations Total	meq/L	0.01	585			585			7.32			7.32			6.10		
	Chloride	mg/L	1	19,600			19,600			77			77			51		
	Ionic Balance	%	0.01	1.94			1.94			5.33			5.33			7.26		
	Sulphate as SO4 - Turbidimetric (filtered)	mg/L	1	2,560			2,560			6			6			22		
Metals																		
	Calcium (filtered)	mg/L	1	418			418			75			75			72		
	Magnesium (filtered)	mg/L	1	1,250			1,250			15			15			15		
	Potassium (filtered)	mg/L	1	537			537			<1			<1			2		
	Sodium (filtered)	mg/L	1	10,300			10,300			54			54			28		

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**
****Elevated RPDs are highlighted as per QAQC Profile settings**
(Acceptable RPDs for each LOR multiplier range are:
No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories.**
Any methods in the row header relate to those used in the primary laboratory

		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022	
		0089_MW120_220110	0089_QC204_220110		0089_MW500_220110	0089_QC105_220110		0089_MW500_220110	0089_QC205_220110		0089_MW195S_220110	0089_QC106_220110		0089_MW195S_220110	0089_QC206_220110	
		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
		EP2200214	854607	RPD	EP2200214	EP2200214	RPD	EP2200214	854607	RPD	EP2200216	EP2200216	RPD	EP2200216	854607	RPD
	Unit															
PFAS - Perfluoroalkyl Sulfonic Acids																
Perfluoropropanesulfonic acid (PFPrS)	µg/L		<0.01						0.02						<0.01	
Perfluorobutane sulfonic acid (PFBS)	µg/L	<0.02	0.02	0	0.17	0.16	6	0.17	0.05	109	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.05	0.04	22	0.57	0.48	17	0.57	0.17	**108**	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	12.7	8.1	**44**	13.6	12.0	12	13.6	8.9	**42**	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	4.29	2.5	**53**	5.59	4.96	12	5.59	5.8	4	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	1.05	0.99	6	45.1	45.8	2	45.1	42	7	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L		<0.01						<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																
Perfluorobutanoic acid (PFBA)	µg/L	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	<0.02	0.02	0	0.13	0.13	0	0.13	0.06	74	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.14	0.08	55	1.30	1.25	4	1.30	0.34	**117**	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	<0.02	0.01	0	0.23	0.21	9	0.23	0.09	**88**	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	2.19	1.6	**31**	1.76	1.60	10	1.76	1.4	**23**	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	<0.02	<0.01	0	<0.02	0.02	0	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																
Perfluorooctane sulfonamide (FOSA)	µg/L	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																
Sum of PFHxS and PFOS	µg/L	13.8	9.09	**41**	58.7	57.8	2	58.7	50.9	14	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS	µg/L	20.4	13.36	**42**	68.4	66.6	3	68.4	58.84	15	<0.01	<0.01	0	<0.01	<0.1	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L		10.69						52.3						<0.01	
Inorganics																
Carbonate Alkalinity (as CaCO3)	mg/L	<1			<1			<1			<1			<1		
Alkalinity (Bicarbonate as CaCO3)	mg/L	258			295			295			595			595		
Alkalinity (Hydroxide) as CaCO3	mg/L	<1			<1			<1			<1			<1		
Alkalinity (total) as CaCO3	mg/L	258			295			295			595			595		
Anions Total	meq/L	7.05			6.86			6.86			48.7			48.7		
Cations Total	meq/L	6.10			5.96			5.96			42.5			42.5		
Chloride	mg/L	51			24			24			1,090			1,090		
Ionic Balance	%	7.26			7.04			7.04			6.82			6.82		
Sulphate as SO4 - Turbidimetric (filtered)	mg/L	22			14			14			292			292		
Metals																
Calcium (filtered)	mg/L	72			89			89			176			176		
Magnesium (filtered)	mg/L	15			10			10			127			127		
Potassium (filtered)	mg/L	2			<1			<1			42			42		
Sodium (filtered)	mg/L	28			16			16			510			510		

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**
****Elevated RPDs are highlighted as per QAQC Profile settings**
(Acceptable RPDs for each LOR multiplier range are:
No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories.**
Any methods in the row header relate to those used in the primary laboratory

			10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022
			0089_SW156_220110	0089_QC107_220110		0089_SW156_220110	0089_QC207_220110		0089_PW329_220110	0089_QC108_220110		0089_PW329_220110	0089_QC208_220110		0089_MW256_220110	0089_QC110_220110		0089_MW256_220110
			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water		Water
		Unit	EP2200218	EP2200218	RPD	EP2200218	854607	RPD	EP2200218	EP2200218	RPD	EP2200218	854607	RPD	EP2200211	EP2200211	RPD	EP2200211
PFAS - Perfluoroalkyl Sulfonic Acids																		
	Perfluoropropanesulfonic acid (PFPrS)	µg/L					<0.01						<0.01					
	Perfluorobutane sulfonic acid (PFBS)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.67	0.62	8	0.67
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.57	0.54	5	0.57
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	4.99	4.67	7	4.99
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.32	0.32	0	0.32
	Perfluorooctane sulfonic acid (PFOS)	µg/L	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	8.18	7.68	6	8.18
	Perfluorononanesulfonic acid (PFNS)	µg/L					<0.01						<0.01					
	Perfluorodecane sulfonic acid (PFDS)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02
PFAS - Perfluoroalkyl Carboxylic Acids																		
	Perfluorobutanoic acid (PFBA)	µg/L	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	0.4	0.4	0	0.4
	Perfluoropentanoic acid (PFPeA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.67	0.63	6	0.67
	Perfluorohexanoic acid (PFHxA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	3.02	2.79	8	3.02
	Perfluoroheptanoic acid (PFHpA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.20	0.19	5	0.20
	Perfluorooctanoic acid (PFOA)	µg/L	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.39	0.37	5	0.39
	Perfluorononanoic acid (PFNA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02
	Perfluorodecanoic acid (PFDA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02
	Perfluoroundecanoic acid (PFUnDA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02
	Perfluorododecanoic acid (PFDoDA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02
	Perfluorotridecanoic acid (PFTrDA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	0.44	0.44	0	0.44
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05
PFAS - Perfluoroalkyl Sulfonamides																		
	Perfluorooctane sulfonamide (FOSA)	µg/L	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	0.07	0.06	15	0.07
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02
	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
PFAS																		
	Sum of PFHxS and PFOS	µg/L	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	13.2	12.4	6	13.2
	Sum of PFAS	µg/L	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	19.9	18.7	6	19.9
	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L					<0.01						<0.01					
Inorganics																		
	Carbonate Alkalinity (as CaCO3)	mg/L	<1			<1			<1			<1			<1			<1
	Alkalinity (Bicarbonate as CaCO3)	mg/L	120			120			178			178			377			377
	Alkalinity (Hydroxide) as CaCO3	mg/L	<1			<1			<1			<1			<1			<1
	Alkalinity (total) as CaCO3	mg/L	120			120			178			178			377			377
	Anions Total	meq/L	602			602			708			708			17.5			17.5
	Cations Total	meq/L	712			712			719			719			14.3			14.3
	Chloride	mg/L	19,500			19,500			22,800			22,800			314			314
	Ionic Balance	%	8.34			8.34			0.78			0.78			10.2			10.2
	Sulphate as SO4 - Turbidimetric (filtered)	mg/L	2,400			2,400			2,940			2,940			53			53
Metals																		
	Calcium (filtered)	mg/L	464			464			467			467			133			133
	Magnesium (filtered)	mg/L	1,500			1,500			1,530			1,530			26			26
	Potassium (filtered)	mg/L	513			513			513			513			7			7
	Sodium (filtered)	mg/L	12,700			12,700			12,800			12,800			122			122

**RPDs have only been considered where a concentration is greater than 1 times the LOR.
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(Acceptable RPDs for each LOR multiplier range are:
No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories.
Any methods in the row header relate to those used in the primary laboratory

			10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		11/01/2022	11/01/2022
			0089_QC210_220110		0089_PW345_220110	0089_QC111_220110		0089_PW345_220110	0089_QC211_220110		0089_MW141_220110	0089_QC112_220110		0089_MW141_220110	0089_QC212_220110		0089-PW367_220111	0089_QC113_220111
			Water		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water
			854607	RPD	EP2200215	EP2200215	RPD	EP2200215	854607	RPD	EP2200214	EP2200214	RPD	EP2200214	854607	RPD	EP2200240	EP2200240
		Unit																
PFAS - Perfluoroalkyl Sulfonic Acids																		
	Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.39						<0.01						0.33			
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.42	**46**	<0.02	<0.02	0	<0.02	<0.01	0	1.18	1.24	5	1.18	0.77	**42**	<0.02	<0.02
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.46	**21**	<0.02	<0.02	0	<0.02	<0.01	0	4.12	2.91	**34**	4.12	2.9	**35**	<0.02	<0.02
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	3.4	**38**	<0.01	<0.01	0	<0.01	<0.01	0	53.7	50.0	7	53.7	57	6	<0.01	<0.01
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.24	**29**	<0.02	<0.02	0	<0.02	<0.01	0	2.68	2.51	7	2.68	2.8	4	<0.02	<0.02
	Perfluorooctane sulfonic acid (PFOS)	µg/L	8.6	5	0.03	0.02	40	0.03	0.02	40	147	127	15	147	130	12	0.06	0.07
	Perfluorononanesulfonic acid (PFNS)	µg/L	0.08						<0.01						<0.1			
	Perfluorodecane sulfonic acid (PFDS)	µg/L	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
PFAS - Perfluoroalkyl Carboxylic Acids																		
	Perfluorobutanoic acid (PFBA)	µg/L	0.34	16	<0.1	<0.1	0	<0.1	<0.05	0	0.4	0.5	22	0.4	0.40	0	<0.1	<0.1
	Perfluoropentanoic acid (PFPeA)	µg/L	0.47	**35**	<0.02	<0.02	0	<0.02	<0.01	0	2.12	2.18	3	2.12	1.9	11	<0.02	<0.02
	Perfluorohexanoic acid (PFHxA)	µg/L	1.5	**67**	<0.02	<0.02	0	<0.02	<0.01	0	27.0	27.2	1	27.0	26	4	<0.02	<0.02
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.13	42	<0.02	<0.02	0	<0.02	<0.01	0	0.93	0.92	1	0.93	0.76	20	<0.02	<0.02
	Perfluorooctanoic acid (PFOA)	µg/L	0.34	14	<0.01	<0.01	0	<0.01	<0.01	0	3.97	3.91	2	3.97	4.0	1	<0.01	<0.01
	Perfluorononanoic acid (PFNA)	µg/L	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.06	0.05	18	0.06	0.05	18	<0.02	<0.02
	Perfluorodecanoic acid (PFDA)	µg/L	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
	Perfluoroundecanoic acid (PFUnDA)	µg/L	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
	Perfluorododecanoic acid (PFDoDA)	µg/L	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
	Perfluorotridecanoic acid (PFTrDA)	µg/L	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.32	32	<0.05	<0.05	0	<0.05	<0.05	0	0.11	0.10	10	0.11	0.08	32	<0.05	<0.05
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05
PFAS - Perfluoroalkyl Sulfonamides																		
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.06	15	<0.02	<0.02	0	<0.02	<0.05	0	0.03	0.03	0	0.03	<0.05	0	<0.02	<0.02
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02
	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05
PFAS																		
	Sum of PFHxS and PFOS	µg/L	12	10	0.03	0.02	40	0.03	0.02	40	201	177	13	201	187	7	0.06	0.07
	Sum of PFAS	µg/L	16.76	17	0.03	0.02	40	0.03	<0.1	0	243	218	11	243	226.99	7	0.06	0.07
	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	12.34						0.02						191			
Inorganics																		
	Carbonate Alkalinity (as CaCO3)	mg/L			<1			<1			<1			<1			<1	
	Alkalinity (Bicarbonate as CaCO3)	mg/L			446			446			494			494			718	
	Alkalinity (Hydroxide) as CaCO3	mg/L			<1			<1			<1			<1			<1	
	Alkalinity (total) as CaCO3	mg/L			446			446			494			494			718	
	Anions Total	meq/L			688			688			218			218			658	
	Cations Total	meq/L			681			681			204			204			693	
	Chloride	mg/L			22,000			22,000			6,790			6,790			21,000	
	Ionic Balance	%			0.53			0.53			3.46			3.46			2.56	
	Sulphate as SO4 - Turbidimetric (filtered)	mg/L			2,820			2,820			825			825			2,490	
Metals																		
	Calcium (filtered)	mg/L			522			522			337			337			554	
	Magnesium (filtered)	mg/L			1,450			1,450			412			412			1,520	
	Potassium (filtered)	mg/L			532			532			141			141			550	
	Sodium (filtered)	mg/L			12,000			12,000			3,440			3,440			12,100	

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**
****Elevated RPDs are highlighted as per QAQC Profile settings**
(Acceptable RPDs for each LOR multiplier range are:
No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories.**
Any methods in the row header relate to those used in the primary laboratory

			RPD	11/01/2022 0089-PW367_220111 Water EP2200240	11/01/2022 0089_QC213_220111 Water 855202	RPD	12/01/2022 0089_MW240_220112 Water EP2200288	12/01/2022 0089_QC115_220112 Water EP2200288	RPD	12/01/2022 0089_MW240_220112 Water EP2200288	12/01/2022 0089_QC215_220112 Water 855202	RPD	12/01/2022 0089_SW372_220112 Water EP2200289	12/01/2022 0089_QC116_220112 Water EP2200289	RPD	12/01/2022 0089_SW372_220112 Water EP2200289	12/01/2022 0089_QC216_220112 Water 855202	RPD
		Unit																	
PFAS - Perfluoroalkyl Sulfonic Acids																			
	Perfluoropropanesulfonic acid (PFPrS)	µg/L			<0.01						<0.01							<0.01	
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0	<0.01	<0.01	0	0.69	0.69	0	0.69	0.65	6	<0.01	<0.01	0	<0.01	<0.01	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorooctane sulfonic acid (PFOS)	µg/L	15	0.06	0.08	29	<0.01	<0.01	0	<0.01	0.01	0	0.03	0.03	0	0.03	0.02	40
	Perfluorononanesulfonic acid (PFNS)	µg/L			<0.01						<0.01						<0.01	
	Perfluorodecane sulfonic acid (PFDS)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																			
	Perfluorobutanoic acid (PFBA)	µg/L	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
	Perfluoropentanoic acid (PFPeA)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorohexanoic acid (PFHxA)	µg/L	0	<0.02	<0.01	0	0.06	0.06	0	0.06	0.04	40	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluoroheptanoic acid (PFHpA)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorooctanoic acid (PFOA)	µg/L	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
	Perfluorononanoic acid (PFNA)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorodecanoic acid (PFDA)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																			
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																			
	Perfluorooctane sulfonamide (FOSA)	µg/L	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																			
	Sum of PFHxS and PFOS	µg/L	15	0.06	0.08	29	0.69	0.69	0	0.69	0.66	4	0.03	0.03	0	0.03	0.02	40
	Sum of PFAS	µg/L	15	0.06	<0.1	0	0.75	0.75	0	0.75	0.7	7	0.03	0.03	0	0.03	<0.1	0
	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L			0.08						0.66						0.02	
Inorganics																			
	Carbonate Alkalinity (as CaCO3)	mg/L		<1			<1	<1	0	<1			<1	<1	0	<1		
	Alkalinity (Bicarbonate as CaCO3)	mg/L		718			299	259	14	299			120	123	2	120		
	Alkalinity (Hydroxide) as CaCO3	mg/L		<1			<1	<1	0	<1			<1	<1	0	<1		
	Alkalinity (total) as CaCO3	mg/L		718			299	259	14	299			120	124	3	120		
	Anions Total	meq/L		658			8.68	6.95	**22**	8.68			610	604	1	610		
	Cations Total	meq/L		693			7.67	6.50	17	7.67			718	652	10	718		
	Chloride	mg/L		21,000			53	35	**41**	53			19,600	19,200	2	19,600		
	Ionic Balance	%		2.56			6.15	3.35	**59**	6.15			8.17	3.78	**73**	8.17		
	Sulphate as SO4 - Turbidimetric (filtered)	mg/L		2,490			58	38	**42**	58			2,610	2,880	10	2,610		
Metals																			
	Calcium (filtered)	mg/L		554			108			108			515			515		
	Magnesium (filtered)	mg/L		1,520			12			12			1,570			1,570		
	Potassium (filtered)	mg/L		550			3			3			594			594		
	Sodium (filtered)	mg/L		12,100			28			28			12,600			12,600		

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**
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(Acceptable RPDs for each LOR multiplier range are:
No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories.**
Any methods in the row header relate to those used in the primary laboratory

			13/01/2022	13/01/2022		13/01/2022	12/01/2022		13/01/2022	13/01/2022		13/01/2022	12/01/2022	
			0089_MW224_220113	0089_QC118_220113		0089_MW224_220113	0089_QC218_220113		0089_PW315_220113	0089_QC119_220113		0089_PW315_220113	0089_QC219_220113	
			Water	Water		Water	Water		Water	Water		Water	Water	
			EP2200339	EP2200339	RPD	EP2200339	855202	RPD	EP2200338	EP2200338	RPD	EP2200338	855202	RPD
		Unit												
PFAS - Perfluoroalkyl Sulfonic Acids														
	Perfluoropropanesulfonic acid (PFPrS)	µg/L					<0.01						<0.01	
	Perfluorobutane sulfonic acid (PFBS)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorooctane sulfonic acid (PFOS)	µg/L	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
	Perfluorononanesulfonic acid (PFNS)	µg/L					<0.01						<0.01	
	Perfluorodecane sulfonic acid (PFDS)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids														
	Perfluorobutanoic acid (PFBA)	µg/L	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
	Perfluoropentanoic acid (PFPeA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorohexanoic acid (PFHxA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluoroheptanoic acid (PFHpA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorooctanoic acid (PFOA)	µg/L	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
	Perfluorononanoic acid (PFNA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorodecanoic acid (PFDA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides														
	Perfluorooctane sulfonamide (FOSA)	µg/L	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS														
	Sum of PFHxS and PFOS	µg/L	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
	Sum of PFAS	µg/L	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0
	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L					<0.01						<0.01	
Inorganics														
	Carbonate Alkalinity (as CaCO3)	mg/L	<1			<1			<1			<1		
	Alkalinity (Bicarbonate as CaCO3)	mg/L	219			219			113			113		
	Alkalinity (Hydroxide) as CaCO3	mg/L	<1			<1			<1			<1		
	Alkalinity (total) as CaCO3	mg/L	219			219			113			113		
	Anions Total	meq/L	8.55			8.55			616			616		
	Cations Total	meq/L	8.55			8.55			640			640		
	Chloride	mg/L	120			120			19,900			19,900		
	Ionic Balance	%	<0.01			<0.01			1.86			1.86		
	Sulphate as SO4 - Turbidimetric (filtered)	mg/L	38			38			2,540			2,540		
Metals														
	Calcium (filtered)	mg/L	58			58			419			419		
	Magnesium (filtered)	mg/L	21			21			1,430			1,430		
	Potassium (filtered)	mg/L	4			4			550			550		
	Sodium (filtered)	mg/L	88			88			11,200			11,200		

**RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings
(Acceptable RPDs for each LOR multiplier range are:
No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories.
Any methods in the row header relate to those used in the primary laboratory

Date			10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		10/01/2022	10/01/2022		11/01/2022	11/01/2022		11/01/2022
Field ID			0089_SD335_220110	0089_QC103_220110		0089_SD335_220110	0089_QC203_220110		0089_SD329_220110	0089_QC109_220110		0089_SD329_220110	0089_QC209_220110		0089_SD367_220111	0089_QC114_220111		0089_SD367_220111
Matrix Type			Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil
Lab Report Number			EP2200217	EP2200217	RPD	EP2200217	854607	RPD	EP2200219	EP2200219	RPD	EP2200219	854607	RPD	EP2200242	EP2200242	RPD	EP2200242
	Unit	LOR																
PFAS - Perfluoroalkyl Sulfonic Acids																		
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005					<0.005						<0.005					
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	0.0004	0.0004	0	0.0004
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005					<0.005						<0.005					
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
PFAS - Perfluoroalkyl Carboxylic Acids																		
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
PFAS - Perfluoroalkyl Sulfonamides																		
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
PFAS																		
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	0.0004	0.0004	0	0.0004
Sum of PFAS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.05	0	<0.0002	<0.0002	0	<0.0002	<0.05	0	0.0004	0.0004	0	0.0004
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	mg/kg	0.005					<0.005						<0.005					

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**
****Elevated RPDs are highlighted as per QAQC Profile settings**
(Acceptable RPDs for each LOR multiplier range are:
No limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

		11/01/2022		12/01/2022	12/01/2022		12/01/2022	12/01/2022	
		0089_QC214_220111		0089_SD346_220112	0089_QC117_220112		0089_SD346_220112	0089_QC217_220112	
		Soil		Soil	Soil		Soil	Soil	
		855202	RPD	EP2200290	EP2200290	RPD	EP2200290	855202	RPD
	Unit								
PFAS - Perfluoroalkyl Sulfonic Acids									
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	<0.005						<0.005	
Perfluorobutane sulfonic acid (PFBS)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	<0.005	0	0.0003	<0.0002	40	0.0003	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	<0.005	0	0.0029	0.0070	**83**	0.0029	<0.005	0
Perfluorononanesulfonic acid (PFNS)	mg/kg	<0.005						<0.005	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	mg/kg	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	mg/kg	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS									
Sum of PFHxS and PFOS	mg/kg	<0.005	0	0.0032	0.0070	**75**	0.0032	<0.005	0
Sum of PFAS	mg/kg	<0.05	0	0.0032	0.0070	**75**	0.0032	<0.05	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	mg/kg	<0.005						<0.005	

**RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings
(Acceptable RPDs for each LOR multiplier range are:
No limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods
vary between laboratories. Any methods in the row header relate to
those used in the primary laboratory

APPENDIX

C

LABORATORY CERTIFICATES

CHAIN OF CUSTODY

ALS COC#: 32186 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW126		10/01/2022 08:30 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW127	Extra pfas bottles for lab internal qc	10/01/2022 09:27 AM	Water	ALS: 5 Non ALS: 0	No	Partial 5/8			
003	0089_MW193	Extra pfas bottles for qc	10/01/2022 10:47 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			
004	0089_MW166		10/01/2022 11:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW236		10/01/2022 12:31 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW256		10/01/2022 01:19 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_QC110		10/01/2022 01:20 PM	Water	ALS: 3 Non ALS: 0	No		X		
008	0089_MW255		10/01/2022 01:24 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
009	0089_MW517		10/01/2022 01:51 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

COC#: 32186 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19
SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW257	2 extra bottles taken for qc analysis	10/01/2022 02:14 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

ALS COC#: 32186 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW126	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW127	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EA015H Total Dissolved Solids - Standard Level - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW193	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW166	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW236	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW256	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW255	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW517	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_MW257	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **32186** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - JS

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW126	HDPE (no PTFE)	20 mL	00352101061705	Grey	No	
001	0089_MW126	HDPE (no PTFE)	20 mL	00352101061793	Grey	No	
001	0089_MW126	Clear Plastic Bottle - Natural	250 mL	00070621200274	Green	No	
002	0089_MW127	Clear Plastic Bottle - Natural	250 mL	00070621200543	Green	No	
002	0089_MW127	HDPE (no PTFE)	20 mL	00352101061738	Grey	No	
002	0089_MW127	HDPE (no PTFE)	20 mL	00352101061728	Grey	No	
002	0089_MW127	HDPE (no PTFE)	20 mL	00352101061555	Grey	No	
002	0089_MW127	HDPE (no PTFE)	20 mL	00352101061572	Grey	No	
003	0089_MW193	HDPE (no PTFE)	20 mL	00352101061751	Grey	No	
003	0089_MW193	HDPE (no PTFE)	20 mL	00352101061634	Grey	No	
003	0089_MW193	Clear Plastic Bottle - Natural	250 mL	00070621200512	Green	No	
003	0089_MW193	HDPE (no PTFE)	20 mL	00352101061619	Grey	No	
003	0089_MW193	HDPE (no PTFE)	20 mL	00352101061819	Grey	No	
004	0089_MW166	Clear Plastic Bottle - Natural	250 mL	00070621200525	Green	No	
004	0089_MW166	HDPE (no PTFE)	20 mL	00352101061623	Grey	No	
004	0089_MW166	HDPE (no PTFE)	20 mL	00352101061731	Grey	No	
005	0089_MW236	Clear Plastic Bottle - Natural	250 mL	00070621200261	Green	No	
005	0089_MW236	HDPE (no PTFE)	20 mL	00352101061578	Grey	No	
005	0089_MW236	HDPE (no PTFE)	20 mL	00352101061720	Grey	No	
006	0089_MW256	Clear Plastic Bottle - Natural	250 mL	00070621200491	Green	No	
006	0089_MW256	HDPE (no PTFE)	20 mL	00352101061760	Grey	No	
006	0089_MW256	HDPE (no PTFE)	20 mL	00352101061697	Grey	No	
007	0089_QC110	Clear Plastic Bottle - Natural	250 mL	00070621200542	Green	No	
007	0089_QC110	HDPE (no PTFE)	20 mL	00352101061686	Grey	No	
007	0089_QC110	HDPE (no PTFE)	20 mL	00352101061559	Grey	No	
008	0089_MW255	HDPE (no PTFE)	20 mL	00352101061656	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 32186 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_MW255	Clear Plastic Bottle - Natural	250 mL	00070621200204	Green	No	
008	0089_MW255	HDPE (no PTFE)	20 mL	00352101061677	Grey	No	
009	0089_MW517	Clear Plastic Bottle - Natural	250 mL	00070621200247	Green	No	
009	0089_MW517	HDPE (no PTFE)	20 mL	00352101061815	Grey	No	
009	0089_MW517	HDPE (no PTFE)	20 mL	00352101061571	Grey	No	
010	0089_MW257	HDPE (no PTFE)	20 mL	00352101061737	Grey	No	
010	0089_MW257	HDPE (no PTFE)	20 mL	00352101061718	Grey	No	
010	0089_MW257	Clear Plastic Bottle - Natural	250 mL	00070621200249	Green	No	
010	0089_MW257	HDPE (no PTFE)	20 mL	00352101061632	Grey	No	
010	0089_MW257	HDPE (no PTFE)	20 mL	00352101061703	Grey	No	

Total Bottle Count: ALS: 36, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200211**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32186	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 09:45	Issue Date	: 11-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 15.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP2200211-002 : 10-Jan-2022 09:27 : 0089_MW127_220110 - Extra pfas bottles for lab internal qc
EP2200211-003 : 10-Jan-2022 10:47 : 0089_MW193_220110 - Extra pfas bottles for qc
EP2200211-010 : 10-Jan-2022 14:14 : 0089_MW257_220110 - 2 extra bottles taken for qc analysis

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200211-001	10-Jan-2022 08:30	0089_MW126_220110	✓	✓	✓	✓
EP2200211-002	10-Jan-2022 09:27	0089_MW127_220110 E...	✓	✓	✓	✓
EP2200211-003	10-Jan-2022 10:47	0089_MW193_220110 E...	✓	✓	✓	✓
EP2200211-004	10-Jan-2022 11:21	0089_MW166_220110	✓	✓	✓	✓
EP2200211-005	10-Jan-2022 12:31	0089_MW236_220110	✓	✓	✓	✓
EP2200211-006	10-Jan-2022 13:19	0089_MW256_220110	✓	✓	✓	✓
EP2200211-007	10-Jan-2022 13:20	0089_QC110_220110		✓		
EP2200211-008	10-Jan-2022 13:24	0089_MW255_220110	✓	✓	✓	✓
EP2200211-009	10-Jan-2022 13:51	0089_MW517_220110	✓	✓	✓	✓
EP2200211-010	10-Jan-2022 14:14	0089_MW257_220110 2...	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200211**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 09:45
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32186	Issue Date	: 17-Jan-2022 18:52
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - JS		
Quote number	: SY/139/19		
No. of samples received	: 10		
No. of samples analysed	: 10		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW126_220110	0089_MW127_220110	0089_MW193_220110	0089_MW166_220110	0089_MW236_220110
				Sampling date / time	10-Jan-2022 08:30	10-Jan-2022 09:27	10-Jan-2022 10:47	10-Jan-2022 11:21	10-Jan-2022 12:31
Compound	CAS Number	LOR	Unit		EP2200211-001	EP2200211-002	EP2200211-003	EP2200211-004	EP2200211-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		639	486	493	366	259
Total Alkalinity as CaCO3	----	1	mg/L		639	486	493	366	259
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1590	1530	84	155	28
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		14100	12100	538	924	42
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		419	364	104	112	89
Magnesium	7439-95-4	1	mg/L		1050	931	70	79	14
Sodium	7440-23-5	1	mg/L		7680	6630	263	422	26
Potassium	7440-09-7	1	mg/L		361	315	22	35	1
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		444	383	26.8	36.6	6.94
ø Total Cations	----	0.01	meq/L		451	391	23.0	31.3	6.75
ø Ionic Balance	----	0.01	%		0.78	1.08	7.68	7.74	1.41
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.55	<0.02	0.33
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.45	0.04	1.43
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	5.67	0.97	34.6
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	0.25	0.16	0.76
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	0.93	7.06	49.9
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	0.1	<0.1	0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	0.20	0.29	0.21
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	1.28	0.37	1.93
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	0.09	0.16	0.84

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW126_220110	0089_MW127_220110	0089_MW193_220110	0089_MW166_220110	0089_MW236_220110
				Sampling date / time	10-Jan-2022 08:30	10-Jan-2022 09:27	10-Jan-2022 10:47	10-Jan-2022 11:21	10-Jan-2022 12:31
					EP2200211-001	EP2200211-002	EP2200211-003	EP2200211-004	EP2200211-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.34**	**0.09**	**2.41**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**3.04**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW126_220110	0089_MW127_220110	0089_MW193_220110	0089_MW166_220110	0089_MW236_220110
				Sampling date / time	10-Jan-2022 08:30	10-Jan-2022 09:27	10-Jan-2022 10:47	10-Jan-2022 11:21	10-Jan-2022 12:31
					EP2200211-001	**EP2200211-002**	**EP2200211-003**	**EP2200211-004**	**EP2200211-005**
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**9.86**	**9.14**	**95.6**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**6.60**	**8.03**	**84.5**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**9.16**	**8.94**	**90.3**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**78.8**	**99.9**	**102**	**102**	**100**
13C8-PFOA	----	0.02	%		**76.7**	**97.8**	**99.9**	**101**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW256_220110	0089_QC110_220110	0089_MW255_220110	0089_MW517_220110	0089_MW257_220110
				Sampling date / time	10-Jan-2022 13:19	10-Jan-2022 13:20	10-Jan-2022 13:24	10-Jan-2022 13:51	10-Jan-2022 14:14
Compound	CAS Number	LOR	Unit		EP2200211-006	EP2200211-007	EP2200211-008	EP2200211-009	EP2200211-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		377	----	270	142	197
Total Alkalinity as CaCO3	----	1	mg/L		377	----	270	142	197
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		53	----	38	6	21
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		314	----	59	139	39
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		133	----	82	59	61
Magnesium	7439-95-4	1	mg/L		26	----	11	5	7
Sodium	7440-23-5	1	mg/L		122	----	52	66	28
Potassium	7440-09-7	1	mg/L		7	----	4	2	4
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		17.5	----	7.85	6.88	5.47
ø Total Cations	----	0.01	meq/L		14.3	----	7.36	6.28	4.94
ø Ionic Balance	----	0.01	%		10.2	----	3.21	4.60	5.12
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.67	0.62	0.06	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.57	0.54	0.04	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		4.99	4.67	0.66	<0.01	0.03
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.32	0.32	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		8.18	7.68	0.40	<0.01	0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.4	0.4	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.67	0.63	0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		3.02	2.79	0.11	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.20	0.19	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW256_220110	0089_QC110_220110	0089_MW255_220110	0089_MW517_220110	0089_MW257_220110
				Sampling date / time	10-Jan-2022 13:19	10-Jan-2022 13:20	10-Jan-2022 13:24	10-Jan-2022 13:51	10-Jan-2022 14:14
Compound	CAS Number	LOR	Unit		EP2200211-006	EP2200211-007	EP2200211-008	EP2200211-009	EP2200211-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.39**	**0.37**	**0.01**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.07**	**0.06**	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.44**	**0.44**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW256_220110	0089_QC110_220110	0089_MW255_220110	0089_MW517_220110	0089_MW257_220110
				Sampling date / time	10-Jan-2022 13:19	10-Jan-2022 13:20	10-Jan-2022 13:24	10-Jan-2022 13:51	10-Jan-2022 14:14
					EP2200211-006	EP2200211-007	EP2200211-008	EP2200211-009	EP2200211-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**19.9**	**18.7**	**1.30**	<0.01	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**13.2**	**12.4**	**1.06**	<0.01	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**19.0**	**17.8**	**1.26**	<0.01	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.0**	**103**	**110**	**97.7**	**102**
13C8-PFOA	----	0.02	%		**103**	**104**	**102**	**98.5**	**103**

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200211**	Page	: 1 of 11
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32186	Issue Date	: 17-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - JS		
Quote number	: SY/139/19		
No. of samples received	: 10		
No. of samples analysed	: 10		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4116617)									
EP2200211-002	0089_MW127_220110	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	486	488	0.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	486	488	0.2	0% - 20%
EP2200212-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	102	106	3.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	102	106	3.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4115031)									
EP2200207-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	946	938	0.8	0% - 20%
EP2200211-009	0089_MW517_220110	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	6	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4115032)									
EP2200207-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	6420	6480	1.1	0% - 20%
EP2200211-009	0089_MW517_220110	ED045G: Chloride	16887-00-6	1	mg/L	139	140	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4115202)									
EP2200211-001	0089_MW126_220110	ED093F: Calcium	7440-70-2	1	mg/L	419	416	0.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1050	1040	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	7680	7620	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	361	358	0.8	0% - 20%
EP2200212-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	428	422	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1280	1270	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10700	10500	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	554	545	1.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4117691)									
EP2200211-002	0089_MW127_220110	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4117692)									
EP2200215-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2200212-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4117691)									
EP2200211-002	0089_MW127_220110	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4117692)									
EP2200215-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4117692) - continued									
EP2200215-004	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2200212-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4117691)									
EP2200211-002	0089_MW127_220110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4117692)									
EP2200215-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4117692) - continued									
EP2200215-004	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2200212-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4117691)									
EP2200211-002	0089_MW127_220110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4117692)									
EP2200215-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2200212-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4117691)									
EP2200211-002	0089_MW127_220110	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4117692)									
EP2200215-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit
EP2200212-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4116617)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	105	81.2	126
				<1	200 mg/L	99.5	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4115031)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	87.7	113
				<1	500 mg/L	97.8	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4115032)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	87.9	114
				<1	1000 mg/L	107	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4115202)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	89.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.9	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117691)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	107	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	117	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	121	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	109	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	115	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117692)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	86.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	72.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	77.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	75.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	74.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	75.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117691)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	127	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117691) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	123	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	122	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	126	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	127	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	131	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117692)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	84.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	79.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	83.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	89.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117691)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	123	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	127	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	119	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	139	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	134	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	128	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117692)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	78.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	68.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	82.8	66.0	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117692) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	83.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	73.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117691)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	114	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	102	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117692)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	81.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	79.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	78.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4115031)							
EP2200207-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4115032)							
EP2200207-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117691)							
EP2200211-003	0089_MW193_220110	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	114	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	105	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	120	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117691) - continued							
EP2200211-003	0089_MW193_220110	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	142	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117692)							
EP2200215-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	107	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	91.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	97.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	95.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	104	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117691)							
EP2200211-003	0089_MW193_220110	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	94.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	129	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	116	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	117	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	126	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	116	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	123	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	108	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	128	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117692)							
EP2200215-009	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	109	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	120	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	96.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	103	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	105	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117691)							
EP2200211-003	0089_MW193_220110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	127	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	113	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	113	62.6	147

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117691) - continued							
EP2200211-003	0089_MW193_220110	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	134	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	130	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	118	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	124	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117692)							
EP2200215-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	103	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	127	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	99.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	113	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117691)							
EP2200211-003	0089_MW193_220110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	110	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	119	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	129	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	130	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117692)							
EP2200215-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	96.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	97.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200211**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling GW - JS	Issue Date	: 17-Jan-2022
Sampler	: [redacted]	No. of samples received	: 10
Order number	: DEF19009/730	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200207--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200207--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200211--003	0089_MW193_220110	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200211--003	0089_MW193_220110	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2200211--003	0089_MW193_220110	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	37	8.11	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW126_220110, 0089_MW127_220110, 0089_MW193_220110, 0089_MW166_220110, 0089_MW236_220110, 0089_MW256_220110, 0089_MW255_220110, 0089_MW517_220110, 0089_MW257_220110	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	24-Jan-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW126_220110, 0089_MW127_220110, 0089_MW193_220110, 0089_MW166_220110, 0089_MW236_220110, 0089_MW256_220110, 0089_MW255_220110, 0089_MW517_220110, 0089_MW257_220110	**10-Jan-2022**	**----**	----	----	**17-Jan-2022**	07-Feb-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW126_220110, 0089_MW127_220110, 0089_MW193_220110, 0089_MW166_220110, 0089_MW236_220110, 0089_MW256_220110, 0089_MW255_220110, 0089_MW517_220110, 0089_MW257_220110	**10-Jan-2022**	**----**	----	----	**17-Jan-2022**	07-Feb-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW126_220110, 0089_MW127_220110, 0089_MW193_220110, 0089_MW166_220110, 0089_MW236_220110, 0089_MW256_220110, 0089_MW255_220110, 0089_MW517_220110, 0089_MW257_220110	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	17-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW126_220110, 0089_MW127_220110, 0089_MW193_220110, 0089_MW166_220110, 0089_MW236_220110, 0089_MW256_220110, 0089_QC110_220110, 0089_MW255_220110, 0089_MW517_220110, 0089_MW257_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW126_220110, 0089_MW127_220110, 0089_MW193_220110, 0089_MW166_220110, 0089_MW236_220110, 0089_MW256_220110, 0089_QC110_220110, 0089_MW255_220110, 0089_MW517_220110, 0089_MW257_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW126_220110,	0089_MW127_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
0089_MW193_220110,	0089_MW166_220110,							
0089_MW236_220110,	0089_MW256_220110,							
0089_QC110_220110,	0089_MW255_220110,							
0089_MW517_220110,	0089_MW257_220110							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW126_220110,	0089_MW127_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
0089_MW193_220110,	0089_MW166_220110,							
0089_MW236_220110,	0089_MW256_220110,							
0089_QC110_220110,	0089_MW255_220110,							
0089_MW517_220110,	0089_MW257_220110							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW126_220110,	0089_MW127_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
0089_MW193_220110,	0089_MW166_220110,							
0089_MW236_220110,	0089_MW256_220110,							
0089_QC110_220110,	0089_MW255_220110,							
0089_MW517_220110,	0089_MW257_220110							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	37	**8.11**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **32188** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW134		10/01/2022 08:46 AM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
002	0089_QC102		10/01/2022 08:47 AM	Water	ALS: 3 Non ALS: 0	No	X			
003	0089_PW341		10/01/2022 09:01 AM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
004	0089_PW363	2 extra pfas bottlee for lab internal qc	10/01/2022 09:12 AM	Water	ALS: 5 Non ALS: 0	No		Partial 4/8		
005	0089_PW362		10/01/2022 09:46 AM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		

CHAIN OF CUSTODY

(ALS) COC#: 32188 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW134	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW341	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW363	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW362	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **32188** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW134	HDPE (no PTFE)	20 mL	00352101061655	Grey	No	
001	0089_SW134	HDPE (no PTFE)	20 mL	00352101061635	Grey	No	
001	0089_SW134	Clear Plastic Bottle - Natural	250 mL	00070621200225	Green	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00352101061605	Grey	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00352101061752	Grey	No	
002	0089_QC102	Clear Plastic Bottle - Natural	250 mL	00070621200529	Green	No	
003	0089_PW341	Clear Plastic Bottle - Natural	250 mL	00070621200535	Green	No	
003	0089_PW341	HDPE (no PTFE)	20 mL	00352101061678	Grey	No	
003	0089_PW341	HDPE (no PTFE)	20 mL	00352101061607	Grey	No	
004	0089_PW363	HDPE (no PTFE)	20 mL	00352101061691	Grey	No	
004	0089_PW363	Clear Plastic Bottle - Natural	250 mL	00070621200246	Green	No	
004	0089_PW363	HDPE (no PTFE)	20 mL	00352101061756	Grey	No	
004	0089_PW363	HDPE (no PTFE)	20 mL	00352101061794	Grey	No	
004	0089_PW363	HDPE (no PTFE)	20 mL	00352101061609	Grey	No	
005	0089_PW362	Clear Plastic Bottle - Natural	250 mL	00070621200501	Green	No	
005	0089_PW362	HDPE (no PTFE)	20 mL	00352101061589	Grey	No	
005	0089_PW362	HDPE (no PTFE)	20 mL	00352101061787	Grey	No	

Total Bottle Count: ALS: 17, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200212**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32188	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW JS		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 09:45	Issue Date	: 11-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 15.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200212-001	10-Jan-2022 08:46	0089_SW134_220110	✓	✓	✓	✓
EP2200212-002	10-Jan-2022 08:47	0089_QC102_220110		✓		
EP2200212-003	10-Jan-2022 09:01	0089_PW341_220110	✓	✓	✓	✓
EP2200212-004	10-Jan-2022 09:12	0089_PW363_220110	✓	✓	✓	✓
EP2200212-005	10-Jan-2022 09:46	0089_PW362_220110	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200212**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 09:45
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32188	Issue Date	: 17-Jan-2022 18:54
Sampler	: [redacted]		
Site	: DEF19009/Stirling SW/PW JS		
Quote number	: SY/139/19		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW134_220110	0089_QC102_220110	----	----	----
				Sampling date / time	10-Jan-2022 08:46	10-Jan-2022 08:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2200212-001	EP2200212-002	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**126**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**126**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2560**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19600**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**418**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1250**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**10300**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**537**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**609**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**585**	----	----	----	----
ø Ionic Balance	----	0.01	%		**1.94**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.03**	**0.03**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW134_220110	0089_QC102_220110	----	----	----
				Sampling date / time	10-Jan-2022 08:46	10-Jan-2022 08:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2200212-001	EP2200212-002	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW134_220110	0089_QC102_220110	----	----	----
				Sampling date / time	10-Jan-2022 08:46	10-Jan-2022 08:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2200212-001	EP2200212-002	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**0.03**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	**0.03**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**0.03**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**108**	----	----	----
13C8-PFOA	----	0.02	%		**98.2**	**102**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW341_220110	0089_PW363_220110	0089_PW362_220110	----	----
				Sampling date / time	10-Jan-2022 09:01	10-Jan-2022 09:12	10-Jan-2022 09:46	----	----
Compound	CAS Number	LOR	Unit		EP2200212-003	EP2200212-004	EP2200212-005	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		102	113	114	----	----
Total Alkalinity as CaCO3	----	1	mg/L		102	113	114	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2610	2610	2810	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19800	20000	20600	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		428	425	430	----	----
Magnesium	7439-95-4	1	mg/L		1280	1260	1310	----	----
Sodium	7440-23-5	1	mg/L		10700	10500	11000	----	----
Potassium	7440-09-7	1	mg/L		554	543	563	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		615	621	642	----	----
ø Total Cations	----	0.01	meq/L		606	596	622	----	----
ø Ionic Balance	----	0.01	%		0.70	2.08	1.56	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	0.02	0.02	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW341_220110	0089_PW363_220110	0089_PW362_220110	----	----
				Sampling date / time	10-Jan-2022 09:01	10-Jan-2022 09:12	10-Jan-2022 09:46	----	----
Compound	CAS Number	LOR	Unit		EP2200212-003	EP2200212-004	EP2200212-005	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW341_220110	0089_PW363_220110	0089_PW362_220110	----	----
				Sampling date / time	10-Jan-2022 09:01	10-Jan-2022 09:12	10-Jan-2022 09:46	----	----
Compound	CAS Number	LOR	Unit		EP2200212-003	EP2200212-004	EP2200212-005	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	**0.02**	**0.02**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.02**	**0.02**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**0.02**	**0.02**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.4**	**106**	**105**	----	----
13C8-PFOA	----	0.02	%		**101**	**102**	**107**	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200212**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32188	Issue Date	: 17-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW JS		
Quote number	: SY/139/19		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4116617)									
EP2200211-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	486	488	0.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	486	488	0.2	0% - 20%
EP2200212-003	0089_PW341_220110	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	102	106	3.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	102	106	3.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4119087)									
EP2200212-001	0089_SW134_220110	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2560	2570	0.4	0% - 20%
EP2200215-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2820	2790	1.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4119086)									
EP2200212-001	0089_SW134_220110	ED045G: Chloride	16887-00-6	1	mg/L	19600	19700	0.4	0% - 20%
EP2200215-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	22000	22100	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4115202)									
EP2200211-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	419	416	0.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1050	1040	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	7680	7620	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	361	358	0.8	0% - 20%
EP2200212-003	0089_PW341_220110	ED093F: Calcium	7440-70-2	1	mg/L	428	422	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1280	1270	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10700	10500	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	554	545	1.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4117692)									
EP2200215-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2200212-004	0089_PW363_220110	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4117692)									
EP2200215-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2200212-004	0089_PW363_220110	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4117692)									
EP2200215-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4117692) - continued									
EP2200215-004	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2200212-004	0089_PW363_220110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4117692)									
EP2200215-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2200212-004	0089_PW363_220110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4117692)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4117692) - continued									
EP2200215-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit
EP2200212-004	0089_PW363_220110	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4116617)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	105	81.2	126
				<1	200 mg/L	99.5	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4119087)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	108	87.7	113
				<1	500 mg/L	105	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4119086)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	87.9	114
				<1	1000 mg/L	107	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4115202)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	89.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.9	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117692)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	86.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	72.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	77.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	75.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	74.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	75.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117692)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	84.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	79.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	83.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117692) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	89.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117692)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	78.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	68.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	82.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	83.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	73.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117692)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	81.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	79.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	78.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4119087)							
EP2200212-001	0089_SW134_220110	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4119086)							
EP2200212-001	0089_SW134_220110	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117692)							
EP2200215-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	107	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	91.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	97.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	95.6	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117692) - continued							
EP2200215-009	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	104	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117692)							
EP2200215-009	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	109	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	120	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	96.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	103	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	105	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117692)							
EP2200215-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	103	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	127	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	99.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	113	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117692)							
EP2200215-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	96.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	97.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200212**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling SW/PW JS	Issue Date	: 17-Jan-2022
Sampler	: [redacted]	No. of samples received	: 5
Order number	: DEF19009/730	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200212--001	0089_SW134_220110	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200212--001	0089_SW134_220110	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW134_220110, 0089_PW363_220110,	0089_PW341_220110, 0089_PW362_220110	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	24-Jan-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW134_220110, 0089_PW363_220110,	0089_PW341_220110, 0089_PW362_220110	**10-Jan-2022**	**----**	----	----	**17-Jan-2022**	07-Feb-2022	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW134_220110, 0089_PW363_220110,	0089_PW341_220110, 0089_PW362_220110	**10-Jan-2022**	**----**	----	----	**17-Jan-2022**	07-Feb-2022	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW134_220110, 0089_PW363_220110,	0089_PW341_220110, 0089_PW362_220110	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	17-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW134_220110, 0089_PW341_220110, 0089_PW362_220110	0089_QC102_220110, 0089_PW363_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW134_220110, 0089_QC102_220110, 0089_PW341_220110, 0089_PW363_220110, 0089_PW362_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW134_220110, 0089_QC102_220110, 0089_PW341_220110, 0089_PW363_220110, 0089_PW362_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW134_220110, 0089_QC102_220110, 0089_PW341_220110, 0089_PW363_220110, 0089_PW362_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW134_220110, 0089_QC102_220110, 0089_PW341_220110, 0089_PW363_220110, 0089_PW362_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 32189 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD341		10/01/2022 09:06 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_SD363		10/01/2022 09:11 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD362		10/01/2022 09:47 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

ALS COC#: 32189 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD341	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_SD363	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD362	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 32189 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD341	HDPE Soil Jar	200 mL	00621019083845	Grey	No	
002	0089_SD363	HDPE Soil Jar	200 mL	00621019083850	Grey	No	
003	0089_SD362	HDPE Soil Jar	200 mL	00621019083922	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200213**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32189	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 09:45	Issue Date	: 11-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 15.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2200213-001	10-Jan-2022 09:06	0089_SD341_220110	✓	✓
EP2200213-002	10-Jan-2022 09:11	0089_SD363_220110	✓	✓
EP2200213-003	10-Jan-2022 09:47	0089_SD362_220110	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200213**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 09:45
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32189	Issue Date	: 19-Jan-2022 13:39
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED JS		
Quote number	: SY/139/19		
No. of samples received	: 3		
No. of samples analysed	: 3		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD341_220110	0089_SD363_220110	0089_SD362_220110	----	----
			Sampling date / time	10-Jan-2022 09:06	10-Jan-2022 09:11	10-Jan-2022 09:47	----	----
Compound	CAS Number	LOR	Unit	EP2200213-001	EP2200213-002	EP2200213-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	<0.1	<0.1	<0.1	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD341_220110	0089_SD363_220110	0089_SD362_220110	----	----
				Sampling date / time	10-Jan-2022 09:06	10-Jan-2022 09:11	10-Jan-2022 09:47	----	----
Compound	CAS Number	LOR	Unit		EP2200213-001	EP2200213-002	EP2200213-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		120	108	116	----	----
13C8-PFOA	----	0.0002	%		110	114	102	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200213**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32189	Issue Date	: 19-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED JS		
Quote number	: SY/139/19		
No. of samples received	: 3		
No. of samples analysed	: 3		

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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4122015)									
EP2200213-003	0089_SD362_220110	EA055: Moisture Content	----	0.1	%	<0.1	<0.1	0.0	No Limit
EP2200219-005	Anonymous	EA055: Moisture Content	----	0.1	%	<0.1	<0.1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4123756)									
EP2200213-001	0089_SD341_220110	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2200219-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123756)									
EP2200213-001	0089_SD341_220110	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123756) - continued									
EP2200213-001	0089_SD341_220110	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2200219-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4123756)									
EP2200213-001	0089_SD341_220110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200219-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4123756)									
EP2200213-001	0089_SD341_220110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200219-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123756)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123756)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	78.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	124	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.5	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.0	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.1	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	87.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	106	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	112	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123756)							
EP2200213-001	0089_SD341_220110	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	114	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	100	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	100	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	102	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	111	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123756)							
EP2200213-001	0089_SD341_220110	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	78.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	106	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	127	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	114	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	119	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	111	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	106	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	101	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	93.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	90.5	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756)							
EP2200213-001	0089_SD341_220110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	97.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	96.5	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	108	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.4	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	107	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	97.6	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756) - continued							
EP2200213-001	0089_SD341_220110	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756)							
EP2200213-001	0089_SD341_220110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	88.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	122	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	92.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	115	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200213**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling SED JS	Issue Date	: 19-Jan-2022
Sampler	: [redacted]	No. of samples received	: 3
Order number	: DEF19009/730	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD341_220110, 0089_SD363_220110, 0089_SD362_220110	**10-Jan-2022**	**----**	----	----	**14-Jan-2022**	24-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD341_220110, 0089_SD363_220110, 0089_SD362_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD341_220110, 0089_SD363_220110, 0089_SD362_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD341_220110, 0089_SD363_220110, 0089_SD362_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD341_220110, 0089_SD363_220110, 0089_SD362_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD341_220110, 0089_SD363_220110, 0089_SD362_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 32179 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling GW

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW123		10/01/2022 08:52 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_QC101		10/01/2022 08:53 AM	Water	ALS: 3 Non ALS: 0	No		X		Extra sample water for lab QC
003	0089_MW121		10/01/2022 09:11 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW120		10/01/2022 09:34 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_QC104		10/01/2022 09:35 AM	Water	ALS: 2 Non ALS: 0	No		X		
006	0089_MW112		10/01/2022 09:52 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_MW117		10/01/2022 10:16 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_QC105		10/01/2022 10:17 AM	Water	ALS: 2 Non ALS: 0	No		X		
009	0089_MW141		10/01/2022 01:44 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

(ALS) COC#: **32179** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling GW

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC112		10/01/2022 01:44 PM	Water	ALS: 3 Non ALS: 0	No		X		extra sample water for lab QC
011	0089_MW149		10/01/2022 02:09 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
012	0089_MW142		10/01/2022 02:10 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
013	0089_MW139		10/01/2022 02:26 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

ALS COC#: 32179 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling GW

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW123	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW121	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW120	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW112	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW117	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW141	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW149	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW142	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_MW139	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32179 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling GW

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW123	Clear Plastic Bottle - Natural	250 mL	00070621199873	Green	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00352101051624	Grey	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00352101051665	Grey	No	
002	0089_QC101	Clear Plastic Bottle - Natural	250 mL	00070621200050	Green	No	
002	0089_QC101	HDPE (no PTFE)	20 mL	00352101051501	Grey	No	
002	0089_QC101	HDPE (no PTFE)	20 mL	00352101051659	Grey	No	
003	0089_MW121	Clear Plastic Bottle - Natural	250 mL	00070621200996	Green	No	
003	0089_MW121	HDPE (no PTFE)	20 mL	00352101051563	Grey	No	
003	0089_MW121	HDPE (no PTFE)	20 mL	00352101051630	Grey	No	
004	0089_MW120	Clear Plastic Bottle - Natural	250 mL	00070621200032	Green	No	
004	0089_MW120	HDPE (no PTFE)	20 mL	00352101051722	Grey	No	
004	0089_MW120	HDPE (no PTFE)	20 mL	00352101051528	Grey	No	
005	0089_QC104	HDPE (no PTFE)	20 mL	00352101051648	Grey	No	
005	0089_QC104	HDPE (no PTFE)	20 mL	00352101051680	Grey	No	
006	0089_MW112	Clear Plastic Bottle - Natural	250 mL	00070621199724	Green	No	
006	0089_MW112	HDPE (no PTFE)	20 mL	00352101051631	Grey	No	
006	0089_MW112	HDPE (no PTFE)	20 mL	00352101051550	Grey	No	
007	0089_MW117	Clear Plastic Bottle - Natural	250 mL	00070621200287	Green	No	
007	0089_MW117	HDPE (no PTFE)	20 mL	00352101051633	Grey	No	
007	0089_MW117	HDPE (no PTFE)	20 mL	00352101051693	Grey	No	
008	0089_QC105	HDPE (no PTFE)	20 mL	00352101051500	Grey	No	
008	0089_QC105	HDPE (no PTFE)	20 mL	00352101051567	Grey	No	
009	0089_MW141	HDPE (no PTFE)	20 mL	00352101061689	Grey	No	
009	0089_MW141	HDPE (no PTFE)	20 mL	00352101061710	Grey	No	
009	0089_MW141	Clear Plastic Bottle - Natural	250 mL	00070621200238	Green	No	
010	0089_QC112	Clear Plastic Bottle - Natural	250 mL	00070621200508	Green	No	

CHAIN OF CUSTODY

COC#: 32179 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling GW

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_QC112	HDPE (no PTFE)	20 mL	00352101061730	Grey	No	
010	0089_QC112	HDPE (no PTFE)	20 mL	00352101061554	Grey	No	
011	0089_MW149	HDPE (no PTFE)	20 mL	00352101061709	Grey	No	
011	0089_MW149	Clear Plastic Bottle - Natural	250 mL	00070621200278	Green	No	
011	0089_MW149	HDPE (no PTFE)	20 mL	00352101061629	Grey	No	
012	0089_MW142	HDPE (no PTFE)	20 mL	00352101061821	Grey	No	
012	0089_MW142	HDPE (no PTFE)	20 mL	00352101061725	Grey	No	
012	0089_MW142	Clear Plastic Bottle - Natural	250 mL	00070621200289	Green	No	
013	0089_MW139	Clear Plastic Bottle - Natural	250 mL	00070621200297	Green	No	
013	0089_MW139	HDPE (no PTFE)	20 mL	00352101061704	Grey	No	
013	0089_MW139	HDPE (no PTFE)	20 mL	00352101061613	Grey	No	

Total Bottle Count: ALS: 37, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200214**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32179	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: MB_DEF19009/Stirling GW		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 09:45	Issue Date	: 11-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 15.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 13 / 13

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200214-001	10-Jan-2022 08:52	0089_MW123_220110	✓	✓	✓	✓
EP2200214-002	10-Jan-2022 08:53	0089_QC101_220110		✓		
EP2200214-003	10-Jan-2022 09:11	0089_MW121_220110	✓	✓	✓	✓
EP2200214-004	10-Jan-2022 09:34	0089_MW120_220110	✓	✓	✓	✓
EP2200214-005	10-Jan-2022 09:35	0089_QC104_220110		✓		
EP2200214-006	10-Jan-2022 09:52	0089_MW112_220110	✓	✓	✓	✓
EP2200214-007	10-Jan-2022 10:16	0089_MW117_220110	✓	✓	✓	✓
EP2200214-008	10-Jan-2022 10:17	0089_QC105_220110		✓		
EP2200214-009	10-Jan-2022 13:44	0089_MW141_220110	✓	✓	✓	✓
EP2200214-010	10-Jan-2022 13:44	0089_QC112_220110		✓		
EP2200214-011	10-Jan-2022 14:09	0089_MW149_220110	✓	✓	✓	✓
EP2200214-012	10-Jan-2022 14:10	0089_MW142_220110	✓	✓	✓	✓
EP2200214-013	10-Jan-2022 14:26	0089_MW139_220110	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200214**	Page	: 1 of 12
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 09:45
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32179	Issue Date	: 17-Jan-2022 18:49
Sampler	: [redacted]		
Site	: MB_DEF19009/Stirling GW		
Quote number	: SY/139/19		
No. of samples received	: 13		
No. of samples analysed	: 13		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_220110	0089_QC101_220110	0089_MW121_220110	0089_MW120_220110	0089_QC104_220110
				Sampling date / time	10-Jan-2022 08:52	10-Jan-2022 08:53	10-Jan-2022 09:11	10-Jan-2022 09:34	10-Jan-2022 09:35
Compound	CAS Number	LOR	Unit		EP2200214-001	EP2200214-002	EP2200214-003	EP2200214-004	EP2200214-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**293**	----	**257**	**258**	----
Total Alkalinity as CaCO3	----	1	mg/L		**293**	----	**257**	**258**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**6**	----	**11**	**22**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**77**	----	**17**	**51**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**75**	----	**66**	**72**	----
Magnesium	7439-95-4	1	mg/L		**15**	----	**12**	**15**	----
Sodium	7440-23-5	1	mg/L		**54**	----	**19**	**28**	----
Potassium	7440-09-7	1	mg/L		<1	----	**2**	**2**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**8.15**	----	**5.84**	**7.05**	----
ø Total Cations	----	0.01	meq/L		**7.32**	----	**5.16**	**6.10**	----
ø Ionic Balance	----	0.01	%		**5.33**	----	**6.22**	**7.26**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.14**	**0.14**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.09**	**0.08**	<0.02	**0.05**	**0.06**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.33**	**0.30**	**0.11**	**12.7**	**13.6**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	**4.29**	**3.75**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	**0.02**	**0.22**	**1.05**	**1.04**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.07**	**0.07**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.38**	**0.37**	**0.04**	**0.14**	**0.14**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_220110	0089_QC101_220110	0089_MW121_220110	0089_MW120_220110	0089_QC104_220110
				Sampling date / time	10-Jan-2022 08:52	10-Jan-2022 08:53	10-Jan-2022 09:11	10-Jan-2022 09:34	10-Jan-2022 09:35
Compound	CAS Number	LOR	Unit		EP2200214-001	EP2200214-002	EP2200214-003	EP2200214-004	EP2200214-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.02**	**2.19**	**2.14**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_220110	0089_QC101_220110	0089_MW121_220110	0089_MW120_220110	0089_QC104_220110
				Sampling date / time	10-Jan-2022 08:52	10-Jan-2022 08:53	10-Jan-2022 09:11	10-Jan-2022 09:34	10-Jan-2022 09:35
Compound	CAS Number	LOR	Unit		EP2200214-001	EP2200214-002	EP2200214-003	EP2200214-004	EP2200214-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.03**	**0.98**	**0.39**	**20.4**	**20.7**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.35**	**0.32**	**0.33**	**13.8**	**14.6**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.94**	**0.90**	**0.39**	**16.1**	**16.9**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**100**	**103**	**104**	**106**
13C8-PFOA	----	0.02	%		**104**	**96.0**	**105**	**99.5**	**97.7**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_220110	0089_MW117_220110	0089_QC105_220110	0089_MW141_220110	0089_QC112_220110
				Sampling date / time	10-Jan-2022 09:52	10-Jan-2022 10:16	10-Jan-2022 10:17	10-Jan-2022 13:44	10-Jan-2022 13:44
Compound	CAS Number	LOR	Unit		EP2200214-006	EP2200214-007	EP2200214-008	EP2200214-009	EP2200214-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		226	295	----	494	----
Total Alkalinity as CaCO3	----	1	mg/L		226	295	----	494	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		14	14	----	825	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		32	24	----	6790	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		66	89	----	337	----
Magnesium	7439-95-4	1	mg/L		7	10	----	412	----
Sodium	7440-23-5	1	mg/L		22	16	----	3440	----
Potassium	7440-09-7	1	mg/L		<1	<1	----	141	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		5.71	6.86	----	218	----
ø Total Cations	----	0.01	meq/L		4.83	5.96	----	204	----
ø Ionic Balance	----	0.01	%		8.38	7.04	----	3.46	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.12	0.17	0.16	1.18	1.24
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.53	0.57	0.48	4.12	2.91
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		13.5	13.6	12.0	53.7	50.0
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.61	5.59	4.96	2.68	2.51
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		45.0	45.1	45.8	147	127
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.2	<0.1	<0.1	0.4	0.5
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.38	0.13	0.13	2.12	2.18
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		2.52	1.30	1.25	27.0	27.2
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.92	0.23	0.21	0.93	0.92

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_220110	0089_MW117_220110	0089_QC105_220110	0089_MW141_220110	0089_QC112_220110
				Sampling date / time	10-Jan-2022 09:52	10-Jan-2022 10:16	10-Jan-2022 10:17	10-Jan-2022 13:44	10-Jan-2022 13:44
Compound	CAS Number	LOR	Unit		EP2200214-006	EP2200214-007	EP2200214-008	EP2200214-009	EP2200214-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.58**	**1.76**	**1.60**	**3.97**	**3.91**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.07**	<0.02	**0.02**	**0.06**	**0.05**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.67**	<0.02	<0.02	**0.03**	**0.03**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	**0.11**	**0.10**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW112_220110	0089_MW117_220110	0089_QC105_220110	0089_MW141_220110	0089_QC112_220110
				Sampling date / time	10-Jan-2022 09:52	10-Jan-2022 10:16	10-Jan-2022 10:17	10-Jan-2022 13:44	10-Jan-2022 13:44
					EP2200214-006	EP2200214-007	EP2200214-008	EP2200214-009	EP2200214-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**65.1**	**68.4**	**66.6**	**243**	**218**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**58.5**	**58.7**	**57.8**	**201**	**177**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**63.2**	**62.3**	**61.2**	**236**	**213**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**84.5**	**96.5**	**76.6**	**61.5**	**62.4**
13C8-PFOA	----	0.02	%		**102**	**100**	**99.4**	**101**	**98.5**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_220110	0089_MW142_220110	0089_MW139_220110	----	----
				Sampling date / time	10-Jan-2022 14:09	10-Jan-2022 14:10	10-Jan-2022 14:26	----	----
Compound	CAS Number	LOR	Unit		EP2200214-011	EP2200214-012	EP2200214-013	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**197**	**434**	**147**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**197**	**434**	**147**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1700**	**1130**	**19**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**11800**	**9350**	**39**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**298**	**388**	**50**	----	----
Magnesium	7439-95-4	1	mg/L		**799**	**694**	**7**	----	----
Sodium	7440-23-5	1	mg/L		**6370**	**5540**	**24**	----	----
Potassium	7440-09-7	1	mg/L		**336**	**238**	**2**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**372**	**296**	**4.43**	----	----
ø Total Cations	----	0.01	meq/L		**366**	**324**	**4.17**	----	----
ø Ionic Balance	----	0.01	%		**0.80**	**4.45**	**3.10**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.06**	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.10**	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	**2.67**	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.09**	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.05**	**3.33**	**0.02**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.06**	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.91**	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_220110	0089_MW142_220110	0089_MW139_220110	----	----
				Sampling date / time	10-Jan-2022 14:09	10-Jan-2022 14:10	10-Jan-2022 14:26	----	----
Compound	CAS Number	LOR	Unit		EP2200214-011	EP2200214-012	EP2200214-013	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.14**	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_220110	0089_MW142_220110	0089_MW139_220110	----	----
				Sampling date / time	10-Jan-2022 14:09	10-Jan-2022 14:10	10-Jan-2022 14:26	----	----
Compound	CAS Number	LOR	Unit		EP2200214-011	EP2200214-012	EP2200214-013	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.06**	**7.36**	**0.02**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.06**	**6.00**	**0.02**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.06**	**7.17**	**0.02**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	**107**	**102**	----	----
13C8-PFOA	----	0.02	%		**101**	**98.3**	**104**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200214**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32179	Issue Date	: 17-Jan-2022
Sampler	: [redacted]		
Site	: MB_DEF19009/Stirling GW		
Quote number	: SY/139/19		
No. of samples received	: 13		
No. of samples analysed	: 13		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4116617)									
EP2200211-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	486	488	0.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	486	488	0.2	0% - 20%
EP2200212-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	102	106	3.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	102	106	3.4	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4116618)									
EP2200214-012	0089_MW142_220110	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	434	428	1.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	434	428	1.4	0% - 20%
EP2200218-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	121	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	121	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4115031)									
EP2200207-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	946	938	0.8	0% - 20%
EP2200211-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	6	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4115032)									
EP2200207-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	6420	6480	1.1	0% - 20%
EP2200211-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	139	140	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4115202)									
EP2200211-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	419	416	0.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1050	1040	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	7680	7620	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	361	358	0.8	0% - 20%
EP2200212-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	428	422	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1280	1270	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10700	10500	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	554	545	1.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4115203)									
EP2200214-012	0089_MW142_220110	ED093F: Calcium	7440-70-2	1	mg/L	388	399	2.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	694	717	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	5540	5740	3.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	238	247	3.8	0% - 20%
EP2200216-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	434	437	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1030	1030	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	8040	8060	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	395	396	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4117691)									
EP2200211-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4117691)									
EP2200211-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4117691)									
EP2200211-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4117691) - continued									
EP2200211-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4117691)									
EP2200211-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4117691)									
EP2200211-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4116617)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	105	81.2	126
				<1	200 mg/L	99.5	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4116618)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	89.4	81.2	126
				<1	200 mg/L	100	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4115031)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	87.7	113
				<1	500 mg/L	97.8	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4115032)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	87.9	114
				<1	1000 mg/L	107	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4115202)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	89.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.9	89.7	108
ED093F: Dissolved Major Cations (QCLot: 4115203)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.1	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	90.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	89.9	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117691)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	107	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	117	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	121	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117691) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	109	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	115	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117691)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	127	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	123	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	122	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	126	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	127	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	131	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117691)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	123	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	127	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	119	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	139	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	134	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	128	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117691)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	114	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	102	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4115031)							
EP2200207-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4115032)							
EP2200207-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117691)							
EP2200211-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	114	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	105	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	120	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	142	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117691)							
EP2200211-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	94.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	129	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	116	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	117	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	126	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	116	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	123	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	108	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	128	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117691)							
EP2200211-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	127	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	113	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	113	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	134	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	130	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	118	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117691) - continued							
EP2200211-003	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	124	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117691)							
EP2200211-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	110	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	119	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	129	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	130	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200214**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: MB_DEF19009/Stirling GW	Issue Date	: 17-Jan-2022
Sampler	: [redacted]	No. of samples received	: 13
Order number	: DEF19009/730	No. of samples analysed	: 13

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200207--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200207--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200211--003	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200211--003	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2200211--003	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	20	5.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / *Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW123_220110, 0089_MW120_220110, 0089_MW117_220110, 0089_MW149_220110, 0089_MW139_220110, 0089_MW121_220110, 0089_MW112_220110, 0089_MW141_220110, 0089_MW142_220110,	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	24-Jan-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW123_220110, 0089_MW120_220110, 0089_MW117_220110, 0089_MW149_220110, 0089_MW139_220110, 0089_MW121_220110, 0089_MW112_220110, 0089_MW141_220110, 0089_MW142_220110,	**10-Jan-2022**	**----**	----	----	**17-Jan-2022**	07-Feb-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW123_220110, 0089_MW120_220110, 0089_MW117_220110, 0089_MW149_220110, 0089_MW139_220110, 0089_MW121_220110, 0089_MW112_220110, 0089_MW141_220110, 0089_MW142_220110,	**10-Jan-2022**	**----**	----	----	**17-Jan-2022**	07-Feb-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW123_220110, 0089_MW120_220110, 0089_MW117_220110, 0089_MW149_220110, 0089_MW139_220110, 0089_MW121_220110, 0089_MW112_220110, 0089_MW141_220110, 0089_MW142_220110,	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	17-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_220110, 0089_MW121_220110, 0089_QC104_220110, 0089_MW117_220110, 0089_MW141_220110, 0089_MW149_220110, 0089_MW139_220110, 0089_QC101_220110, 0089_MW120_220110, 0089_MW112_220110, 0089_QC105_220110, 0089_QC112_220110, 0089_MW142_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_220110, 0089_QC101_220110, 0089_MW121_220110, 0089_MW120_220110, 0089_QC104_220110, 0089_MW112_220110, 0089_MW117_220110, 0089_QC105_220110, 0089_MW141_220110, 0089_QC112_220110, 0089_MW149_220110, 0089_MW142_220110, 0089_MW139_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW123_220110, 0089_QC101_220110, 0089_MW121_220110, 0089_MW120_220110, 0089_QC104_220110, 0089_MW112_220110, 0089_MW117_220110, 0089_QC105_220110, 0089_MW141_220110, 0089_QC112_220110, 0089_MW149_220110, 0089_MW142_220110, 0089_MW139_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_220110, 0089_QC101_220110, 0089_MW121_220110, 0089_MW120_220110, 0089_QC104_220110, 0089_MW112_220110, 0089_MW117_220110, 0089_QC105_220110, 0089_MW141_220110, 0089_QC112_220110, 0089_MW149_220110, 0089_MW142_220110, 0089_MW139_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW123_220110, 0089_QC101_220110, 0089_MW121_220110, 0089_MW120_220110, 0089_QC104_220110, 0089_MW112_220110, 0089_MW117_220110, 0089_QC105_220110, 0089_MW141_220110, 0089_QC112_220110, 0089_MW149_220110, 0089_MW142_220110, 0089_MW139_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 32187 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW130		10/01/2022 08:36 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW335		10/01/2022 09:03 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW364		10/01/2022 09:24 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW132		10/01/2022 09:42 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc
005	0089_PW340		10/01/2022 09:43 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW369		10/01/2022 01:01 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW345		10/01/2022 01:37 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_QC111		10/01/2022 01:39 PM	Water	ALS: 3 Non ALS: 0	No	Partial 1/8		
009	0089_SW370		10/01/2022 01:45 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc

CHAIN OF CUSTODY

ALS COC#: 32187 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW130	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW335	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW364	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW132	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW340	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW369	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW345	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_QC111	Surface Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
009	0089_SW370	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32187 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW130	Clear Plastic Bottle - Natural	250 mL	00070621200486	Green	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00352101061675	Grey	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00352101061592	Grey	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00352101061565	Grey	No	
002	0089_PW335	Clear Plastic Bottle - Natural	250 mL	00070621200554	Green	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00352101061652	Grey	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00352101061811	Grey	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00352101061676	Grey	No	
003	0089_PW364	Clear Plastic Bottle - Natural	250 mL	00070621200265	Green	No	
004	0089_SW132	HDPE (no PTFE)	20 mL	00352101061739	Grey	No	
004	0089_SW132	HDPE (no PTFE)	20 mL	00352101061575	Grey	No	
004	0089_SW132	Clear Plastic Bottle - Natural	250 mL	00070621200524	Green	No	
004	0089_SW132	HDPE (no PTFE)	20 mL	00350019177743	Grey	No	
004	0089_SW132	HDPE (no PTFE)	20 mL	00352101028303	Grey	No	
005	0089_PW340	HDPE (no PTFE)	20 mL	00352101052158	Grey	No	
005	0089_PW340	HDPE (no PTFE)	20 mL	00352101052350	Grey	No	
005	0089_PW340	Clear Plastic Bottle - Natural	250 mL	00070621200571	Green	No	
006	0089_PW369	Clear Plastic Bottle - Natural	250 mL	00070621200255	Green	No	
006	0089_PW369	HDPE (no PTFE)	20 mL	00352101061591	Grey	No	
006	0089_PW369	HDPE (no PTFE)	20 mL	00352101061577	Grey	No	
007	0089_PW345	Clear Plastic Bottle - Natural	250 mL	00070621200509	Green	No	
007	0089_PW345	HDPE (no PTFE)	20 mL	00352101061714	Grey	No	
007	0089_PW345	HDPE (no PTFE)	20 mL	00352101061615	Grey	No	
008	0089_QC111	Clear Plastic Bottle - Natural	250 mL	00070621200519	Green	No	
008	0089_QC111	HDPE (no PTFE)	20 mL	00352101061800	Grey	No	
008	0089_QC111	HDPE (no PTFE)	20 mL	00352101061711	Grey	No	

CHAIN OF CUSTODY

COC#: 32187 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

009	0089_SW370	Clear Plastic Bottle - Natural	250 mL	00070621200573	Green	No	
009	0089_SW370	HDPE (no PTFE)	20 mL	00352101061776	Grey	No	
009	0089_SW370	HDPE (no PTFE)	20 mL	00352101061645	Grey	No	
009	0089_SW370	HDPE (no PTFE)	20 mL	00352101061778	Grey	No	
009	0089_SW370	HDPE (no PTFE)	20 mL	00352101061799	Grey	No	

Total Bottle Count: ALS: 31, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200215**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32187	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW - AG		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 09:45	Issue Date	: 11-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 15.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200215-001	10-Jan-2022 08:36	0089_SW130_220110	✓	✓	✓	✓
EP2200215-002	10-Jan-2022 09:03	0089_PW335_220110	✓	✓	✓	✓
EP2200215-003	10-Jan-2022 09:24	0089_PW364_220110	✓	✓	✓	✓
EP2200215-004	10-Jan-2022 09:42	0089_SW132_220110	✓	✓	✓	✓
EP2200215-005	10-Jan-2022 09:43	0089_PW340_220110	✓	✓	✓	✓
EP2200215-006	10-Jan-2022 13:01	0089_PW369_220110	✓	✓	✓	✓
EP2200215-007	10-Jan-2022 13:37	0089_PW345_220110	✓	✓	✓	✓
EP2200215-008	10-Jan-2022 13:39	0089_QC111_220110		✓		
EP2200215-009	10-Jan-2022 13:45	0089_SW370_220110	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200215**	Page	: 1 of 11
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 09:45
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32187	Issue Date	: 17-Jan-2022 18:50
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_220110	0089_SW132_220110	0089_SW370_220110	----	----
				Sampling date / time	10-Jan-2022 08:36	10-Jan-2022 09:42	10-Jan-2022 13:45	----	----
Compound	CAS Number	LOR	Unit		EP2200215-001	EP2200215-004	EP2200215-009	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		128	127	128	----	----
Total Alkalinity as CaCO3	----	1	mg/L		128	127	128	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2630	2620	2580	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20000	19800	19600	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		434	418	421	----	----
Magnesium	7439-95-4	1	mg/L		1290	1250	1260	----	----
Sodium	7440-23-5	1	mg/L		10600	10300	10400	----	----
Potassium	7440-09-7	1	mg/L		556	534	535	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		621	616	609	----	----
ø Total Cations	----	0.01	meq/L		603	585	591	----	----
ø Ionic Balance	----	0.01	%		1.50	2.51	1.53	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	0.02	0.04	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_220110	0089_SW132_220110	0089_SW370_220110	----	----
				Sampling date / time	10-Jan-2022 08:36	10-Jan-2022 09:42	10-Jan-2022 13:45	----	----
Compound	CAS Number	LOR	Unit		EP2200215-001	EP2200215-004	EP2200215-009	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_220110	0089_SW132_220110	0089_SW370_220110	----	----
				Sampling date / time	10-Jan-2022 08:36	10-Jan-2022 09:42	10-Jan-2022 13:45	----	----
Compound	CAS Number	LOR	Unit		EP2200215-001	EP2200215-004	EP2200215-009	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	**0.02**	**0.04**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.02**	**0.04**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**0.02**	**0.04**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**106**	**105**	----	----
13C8-PFOA	----	0.02	%		**104**	**102**	**108**	----	----

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW335_220110	0089_PW364_220110	0089_PW340_220110	0089_PW369_220110	0089_PW345_220110
				Sampling date / time	10-Jan-2022 09:03	10-Jan-2022 09:24	10-Jan-2022 09:43	10-Jan-2022 13:01	10-Jan-2022 13:37
					EP2200215-002	EP2200215-003	EP2200215-005	EP2200215-006	EP2200215-007
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**114**	**113**	**121**	**207**	**446**
Total Alkalinity as CaCO3	----	1	mg/L		**114**	**113**	**121**	**207**	**446**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2770**	**2690**	**2700**	**2880**	**2820**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20000**	**20200**	**20000**	**21300**	**22000**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**417**	**429**	**445**	**485**	**522**
Magnesium	7439-95-4	1	mg/L		**1260**	**1290**	**1330**	**1380**	**1450**
Sodium	7440-23-5	1	mg/L		**10400**	**10700**	**11100**	**11500**	**12000**
Potassium	7440-09-7	1	mg/L		**532**	**551**	**577**	**519**	**532**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**624**	**628**	**623**	**665**	**688**
ø Total Cations	----	0.01	meq/L		**590**	**607**	**629**	**651**	**681**
ø Ionic Balance	----	0.01	%		**2.77**	**1.70**	**0.51**	**1.04**	**0.53**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	**0.02**	**0.02**	**0.06**	**0.03**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW335_220110	0089_PW364_220110	0089_PW340_220110	0089_PW369_220110	0089_PW345_220110
				Sampling date / time	10-Jan-2022 09:03	10-Jan-2022 09:24	10-Jan-2022 09:43	10-Jan-2022 13:01	10-Jan-2022 13:37
Compound	CAS Number	LOR	Unit		EP2200215-002	EP2200215-003	EP2200215-005	EP2200215-006	EP2200215-007
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.11**	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW335_220110	0089_PW364_220110	0089_PW340_220110	0089_PW369_220110	0089_PW345_220110
				Sampling date / time	10-Jan-2022 09:03	10-Jan-2022 09:24	10-Jan-2022 09:43	10-Jan-2022 13:01	10-Jan-2022 13:37
Compound	CAS Number	LOR	Unit		EP2200215-002	EP2200215-003	EP2200215-005	EP2200215-006	EP2200215-007
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.13**	**0.02**	**0.02**	**0.06**	**0.03**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.02**	**0.02**	**0.06**	**0.03**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.13**	**0.02**	**0.02**	**0.06**	**0.03**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**98.6**	**106**	**105**	**102**
13C8-PFOA	----	0.02	%		**99.1**	**99.3**	**103**	**100**	**102**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC111_220110	----	----	----	----
				Sampling date / time	10-Jan-2022 13:39	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200215-008	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC111_220110	----	----	----	----
				Sampling date / time	10-Jan-2022 13:39	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200215-008	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	----	----	----	----
13C8-PFOA	----	0.02	%		**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200215**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32187	Issue Date	: 17-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4116618)									
EP2200214-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	434	428	1.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	434	428	1.4	0% - 20%
EP2200218-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	121	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	121	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4119087)									
EP2200212-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2560	2570	0.4	0% - 20%
EP2200215-007	0089_PW345_220110	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2820	2790	1.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4119086)									
EP2200212-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19600	19700	0.4	0% - 20%
EP2200215-007	0089_PW345_220110	ED045G: Chloride	16887-00-6	1	mg/L	22000	22100	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4115203)									
EP2200214-012	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	388	399	2.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	694	717	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	5540	5740	3.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	238	247	3.8	0% - 20%
EP2200216-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	434	437	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1030	1030	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	8040	8060	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	395	396	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4117692)									
EP2200215-004	0089_SW132_220110	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2200212-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4117692)									
EP2200215-004	0089_SW132_220110	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2200212-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4117692)									
EP2200215-004	0089_SW132_220110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4117692) - continued									
EP2200215-004	0089_SW132_220110	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2200212-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4117692)									
EP2200215-004	0089_SW132_220110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2200212-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4117692)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4117692) - continued									
EP2200215-004	0089_SW132_220110	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit
EP2200212-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4116618)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	89.4	81.2	126
				<1	200 mg/L	100	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4119087)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	108	87.7	113
				<1	500 mg/L	105	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4119086)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	87.9	114
				<1	1000 mg/L	107	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4115203)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.1	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	90.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	89.9	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117692)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	86.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	72.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	77.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	75.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	74.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	75.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117692)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	84.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	79.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	83.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117692) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	89.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117692)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	78.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	68.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	82.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	83.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	73.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117692)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	81.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	79.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	78.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4119087)							
EP2200212-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4119086)							
EP2200212-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117692)							
EP2200215-009	0089_SW370_220110	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	107	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	91.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	97.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	95.6	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4117692) - continued							
EP2200215-009	0089_SW370_220110	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	104	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4117692)							
EP2200215-009	0089_SW370_220110	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	109	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	120	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	96.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	103	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	105	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4117692)							
EP2200215-009	0089_SW370_220110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	103	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	127	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	99.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	113	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4117692)							
EP2200215-009	0089_SW370_220110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	96.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	97.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200215**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling SW/PW - AG	Issue Date	: 17-Jan-2022
Sampler	: [redacted]	No. of samples received	: 9
Order number	: DEF19009/730	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200212--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200212--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW130_220110,	0089_PW335_220110,	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	24-Jan-2022	✓
0089_PW364_220110,	0089_SW132_220110,							
0089_PW340_220110,	0089_PW369_220110,							
0089_PW345_220110,	0089_SW370_220110							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW130_220110,	0089_PW335_220110,	**10-Jan-2022**	**----**	----	----	**17-Jan-2022**	07-Feb-2022	✓
0089_PW364_220110,	0089_SW132_220110,							
0089_PW340_220110,	0089_PW369_220110,							
0089_PW345_220110,	0089_SW370_220110							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW130_220110,	0089_PW335_220110,	**10-Jan-2022**	**----**	----	----	**17-Jan-2022**	07-Feb-2022	✓
0089_PW364_220110,	0089_SW132_220110,							
0089_PW340_220110,	0089_PW369_220110,							
0089_PW345_220110,	0089_SW370_220110							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW130_220110, 0089_PW335_220110, 0089_PW364_220110, 0089_SW132_220110, 0089_PW340_220110, 0089_PW369_220110, 0089_PW345_220110, 0089_SW370_220110	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	17-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW130_220110, 0089_PW335_220110, 0089_PW364_220110, 0089_SW132_220110, 0089_PW340_220110, 0089_PW369_220110, 0089_PW345_220110, 0089_QC111_220110, 0089_SW370_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW130_220110, 0089_PW335_220110, 0089_PW364_220110, 0089_SW132_220110, 0089_PW340_220110, 0089_PW369_220110, 0089_PW345_220110, 0089_QC111_220110, 0089_SW370_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW130_220110, 0089_PW335_220110, 0089_PW364_220110, 0089_SW132_220110, 0089_PW340_220110, 0089_PW369_220110, 0089_PW345_220110, 0089_QC111_220110, 0089_SW370_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW130_220110, 0089_PW335_220110, 0089_PW364_220110, 0089_SW132_220110, 0089_PW340_220110, 0089_PW369_220110, 0089_PW345_220110, 0089_QC111_220110, 0089_SW370_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW130_220110, 0089_PW335_220110, 0089_PW364_220110, 0089_SW132_220110, 0089_PW340_220110, 0089_PW369_220110, 0089_PW345_220110, 0089_QC111_220110, 0089_SW370_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: 32191 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW124		10/01/2022 08:52 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_MW125		10/01/2022 09:40 AM	Water	ALS: 3 Non ALS: 0	No	Partial 5/8		
003	0089_MW199		10/01/2022 10:31 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW195S		10/01/2022 10:51 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_QC106		10/01/2022 10:52 AM	Water	ALS: 3 Non ALS: 0	No	Partial 1/8		
006	0089_MW195D		10/01/2022 11:03 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW161		10/01/2022 12:36 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_MW171		10/01/2022 12:37 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc
009	0089_MW200		10/01/2022 01:20 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

(ALS) COC#: **32191** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW203		10/01/2022 02:12 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_MW233		10/01/2022 02:42 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 32191 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW124	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW125	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EA015H Total Dissolved Solids - Standard Level - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW199	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW195S	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_QC106	Ground Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
006	0089_MW195D	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW161	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW171	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW200	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32191 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_MW203	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW233	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 32191 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW124	Clear Plastic Bottle - Natural	250 mL	00070621200497	Green	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00352101061563	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00352101061810	Grey	No	
002	0089_MW125	HDPE (no PTFE)	20 mL	00352101061768	Grey	No	
002	0089_MW125	Clear Plastic Bottle - Natural	250 mL	00070621200547	Green	No	
002	0089_MW125	HDPE (no PTFE)	20 mL	00352101061769	Grey	No	
003	0089_MW199	Clear Plastic Bottle - Natural	250 mL	00070621200273	Green	No	
003	0089_MW199	HDPE (no PTFE)	20 mL	00352101061747	Grey	No	
003	0089_MW199	HDPE (no PTFE)	20 mL	00352101061543	Grey	No	
004	0089_MW195S	Clear Plastic Bottle - Natural	250 mL	00070621200295	Green	No	
004	0089_MW195S	HDPE (no PTFE)	20 mL	00352101061702	Grey	No	
004	0089_MW195S	HDPE (no PTFE)	20 mL	00352101061660	Grey	No	
005	0089_QC106	Clear Plastic Bottle - Natural	250 mL	00070621200568	Green	No	
005	0089_QC106	HDPE (no PTFE)	20 mL	00352101061834	Grey	No	
005	0089_QC106	HDPE (no PTFE)	20 mL	00352101061603	Grey	No	
006	0089_MW195D	HDPE (no PTFE)	20 mL	00352101061775	Grey	No	
006	0089_MW195D	HDPE (no PTFE)	20 mL	00352101061784	Grey	No	
006	0089_MW195D	Clear Plastic Bottle - Natural	250 mL	00070621200234	Green	No	
007	0089_MW161	Clear Plastic Bottle - Natural	250 mL	00070621200564	Green	No	
007	0089_MW161	HDPE (no PTFE)	20 mL	00352101061765	Grey	No	
007	0089_MW161	HDPE (no PTFE)	20 mL	00352101061673	Grey	No	
008	0089_MW171	Clear Plastic Bottle - Natural	250 mL	00070621200192	Green	No	
008	0089_MW171	HDPE (no PTFE)	20 mL	00352101061547	Grey	No	
008	0089_MW171	HDPE (no PTFE)	20 mL	00352101061695	Grey	No	
008	0089_MW171	HDPE (no PTFE)	20 mL	00352010040149	Grey	No	
008	0089_MW171	HDPE (no PTFE)	20 mL	00352010040234	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: **32191** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW200	Clear Plastic Bottle - Natural	250 mL	00070621200245	Green	No	
009	0089_MW200	HDPE (no PTFE)	20 mL	00352101061598	Grey	No	
009	0089_MW200	HDPE (no PTFE)	20 mL	00352101061599	Grey	No	
010	0089_MW203	Clear Plastic Bottle - Natural	250 mL	00070621200556	Green	No	
010	0089_MW203	HDPE (no PTFE)	20 mL	00352101061641	Grey	No	
010	0089_MW203	HDPE (no PTFE)	20 mL	00352101061715	Grey	No	
011	0089_MW233	Clear Plastic Bottle - Natural	250 mL	00070621200562	Green	No	
011	0089_MW233	HDPE (no PTFE)	20 mL	00352101061707	Grey	No	
011	0089_MW233	HDPE (no PTFE)	20 mL	00352101061580	Grey	No	

Total Bottle Count: ALS: 35, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200216**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32191	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 09:45	Issue Date	: 11-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 15.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200216-001	10-Jan-2022 08:52	0089_MW124_220110	✓	✓	✓	✓
EP2200216-002	10-Jan-2022 09:40	0089_MW125_220110	✓	✓	✓	✓
EP2200216-003	10-Jan-2022 10:31	0089_MW199_220110	✓	✓	✓	✓
EP2200216-004	10-Jan-2022 10:51	0089_MW195S_220110	✓	✓	✓	✓
EP2200216-005	10-Jan-2022 10:52	0089_QC106_220110		✓		
EP2200216-006	10-Jan-2022 11:03	0089_MW195D_220110	✓	✓	✓	✓
EP2200216-007	10-Jan-2022 12:36	0089_MW161_220110	✓	✓	✓	✓
EP2200216-008	10-Jan-2022 12:37	0089_MW171_220110	✓	✓	✓	✓
EP2200216-009	10-Jan-2022 13:20	0089_MW200_220110	✓	✓	✓	✓
EP2200216-010	10-Jan-2022 14:12	0089_MW203_220110	✓	✓	✓	✓
EP2200216-011	10-Jan-2022 14:42	0089_MW233_220110	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200216**	Page	: 1 of 12
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 09:45
Order number	: DEF19009/730	Date Analysis Commenced	: 11-Jan-2022
C-O-C number	: 32191	Issue Date	: 18-Jan-2022 12:12
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW124_220110	0089_MW125_220110	0089_MW199_220110	0089_MW195S_220110	0089_QC106_220110
				Sampling date / time	10-Jan-2022 08:52	10-Jan-2022 09:40	10-Jan-2022 10:31	10-Jan-2022 10:51	10-Jan-2022 10:52
					EP2200216-001	EP2200216-002	EP2200216-003	EP2200216-004	EP2200216-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**536**	**382**	**396**	**595**	----
Total Alkalinity as CaCO3	----	1	mg/L		**536**	**382**	**396**	**595**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1680**	**1730**	**229**	**292**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**13700**	**13300**	**2110**	**1090**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**434**	**401**	**106**	**176**	----
Magnesium	7439-95-4	1	mg/L		**1030**	**948**	**139**	**127**	----
Sodium	7440-23-5	1	mg/L		**8040**	**7200**	**1130**	**510**	----
Potassium	7440-09-7	1	mg/L		**395**	**354**	**54**	**42**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**432**	**419**	**72.2**	**48.7**	----
ø Total Cations	----	0.01	meq/L		**466**	**420**	**67.3**	**42.5**	----
ø Ionic Balance	----	0.01	%		**3.80**	**0.17**	**3.54**	**6.82**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.20**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.17**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.63**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.02**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.20**	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW124_220110	0089_MW125_220110	0089_MW199_220110	0089_MW195S_220110	0089_QC106_220110
				Sampling date / time	10-Jan-2022 08:52	10-Jan-2022 09:40	10-Jan-2022 10:31	10-Jan-2022 10:51	10-Jan-2022 10:52
					EP2200216-001	EP2200216-002	EP2200216-003	EP2200216-004	EP2200216-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_220110	0089_MW125_220110	0089_MW199_220110	0089_MW195S_220110	0089_QC106_220110
				Sampling date / time	10-Jan-2022 08:52	10-Jan-2022 09:40	10-Jan-2022 10:31	10-Jan-2022 10:51	10-Jan-2022 10:52
Compound	CAS Number	LOR	Unit		EP2200216-001	EP2200216-002	EP2200216-003	EP2200216-004	EP2200216-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**1.22**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.63**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**1.05**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**103**	**111**	**104**	**111**
13C8-PFOA	----	0.02	%		**104**	**97.6**	**105**	**99.2**	**100**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW195D_220110	0089_MW161_220110	0089_MW171_220110	0089_MW200_220110	0089_MW203_220110
				Sampling date / time	10-Jan-2022 11:03	10-Jan-2022 12:36	10-Jan-2022 12:37	10-Jan-2022 13:20	10-Jan-2022 14:12
Compound	CAS Number	LOR	Unit		EP2200216-006	EP2200216-007	EP2200216-008	EP2200216-009	EP2200216-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		172	460	463	411	302
Total Alkalinity as CaCO3	----	1	mg/L		172	460	463	411	302
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1560	145	552	187	108
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		11600	654	4740	1780	70
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		379	84	192	81	65
Magnesium	7439-95-4	1	mg/L		752	82	340	86	39
Sodium	7440-23-5	1	mg/L		5500	310	2340	978	57
Potassium	7440-09-7	1	mg/L		261	32	111	53	7
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		363	30.6	154	62.3	10.2
ø Total Cations	----	0.01	meq/L		327	25.2	142	55.0	9.11
ø Ionic Balance	----	0.01	%		5.28	9.69	4.14	6.22	5.91
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.08	0.10	<0.02	0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.08	0.04	<0.02	0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.89	0.18	<0.01	0.07
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.14	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	5.45	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.14	0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.34	0.12	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW195D_220110	0089_MW161_220110	0089_MW171_220110	0089_MW200_220110	0089_MW203_220110
				Sampling date / time	10-Jan-2022 11:03	10-Jan-2022 12:36	10-Jan-2022 12:37	10-Jan-2022 13:20	10-Jan-2022 14:12
Compound	CAS Number	LOR	Unit		EP2200216-006	EP2200216-007	EP2200216-008	EP2200216-009	EP2200216-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.11**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.10**	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW195D_220110	0089_MW161_220110	0089_MW171_220110	0089_MW200_220110	0089_MW203_220110
				Sampling date / time	10-Jan-2022 11:03	10-Jan-2022 12:36	10-Jan-2022 12:37	10-Jan-2022 13:20	10-Jan-2022 14:12
Compound	*CAS Number*	*LOR*	*Unit*		**EP2200216-006**	**EP2200216-007**	**EP2200216-008**	**EP2200216-009**	**EP2200216-010**
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**7.33**	**0.46**	<0.01	**0.11**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**6.34**	**0.18**	<0.01	**0.07**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**7.11**	**0.42**	<0.01	**0.09**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**111**	**105**	**110**	**111**
13C8-PFOA	----	0.02	%		**105**	**102**	**103**	**103**	**103**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_220110	----	----	----	----
				Sampling date / time	10-Jan-2022 14:42	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200216-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**93**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**93**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**4**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**57**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**37**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**4**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**18**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**2**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**3.55**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**3.01**	----	----	----	----
ø Ionic Balance	----	0.01	%		**8.23**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.34**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_220110	----	----	----	----
				Sampling date / time	10-Jan-2022 14:42	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200216-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_220110	----	----	----	----
				Sampling date / time	10-Jan-2022 14:42	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200216-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.35**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.35**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.35**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	----	----	----	----
13C8-PFOA	----	0.02	%		**106**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200216**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 11-Jan-2022
C-O-C number	: 32191	Issue Date	: 18-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4114702)									
EP2200216-009	0089_MW200_220110	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	411	405	1.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	411	405	1.4	0% - 20%
EP2200194-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	116	118	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	116	118	1.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4115034)									
EP2200216-001	0089_MW124_220110	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1680	1670	0.3	0% - 20%
EP2200218-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2400	2530	5.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4115033)									
EP2200216-001	0089_MW124_220110	ED045G: Chloride	16887-00-6	1	mg/L	13700	14200	3.8	0% - 20%
EP2200218-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19500	19400	0.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4115203)									
EP2200214-012	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	388	399	2.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	694	717	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	5540	5740	3.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	238	247	3.8	0% - 20%
EP2200216-001	0089_MW124_220110	ED093F: Calcium	7440-70-2	1	mg/L	434	437	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1030	1030	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	8040	8060	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	395	396	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4118392)									
EP2200216-008	0089_MW171_220110	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.18	0.21	16.8	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.10	0.12	13.6	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.05	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4118392)									
EP2200216-008	0089_MW171_220110	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.12	0.14	13.8	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4118392)									
EP2200216-008	0089_MW171_220110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4118392)									
EP2200216-008	0089_MW171_220110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4118392) - continued									
EP2200216-008	0089_MW171_220110	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4118392)									
EP2200216-008	0089_MW171_220110	EP231X: Sum of PFAS	----	0.01	µg/L	0.46	0.55	17.8	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4114702)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	105	81.2	126
				<1	200 mg/L	98.9	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4115034)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.4	87.7	113
				<1	500 mg/L	101	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4115033)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	87.9	114
				<1	1000 mg/L	104	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4115203)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.1	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	90.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	89.9	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4118392)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	105	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	98.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4118392)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	129	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	114	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4118392) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4118392)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	111	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	125	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	108	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4118392)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	107	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	110	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	111	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4115034)							
EP2200216-001	0089_MW124_220110	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4115033)							
EP2200216-001	0089_MW124_220110	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200216**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling GW - AG	Issue Date	: 18-Jan-2022
Sampler	: [redacted]	No. of samples received	: 11
Order number	: DEF19009/730	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200216--001	0089_MW124_220110	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200216--001	0089_MW124_220110	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	11	9.09	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	11	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)		*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW124_220110,	0089_MW125_220110,	**10-Jan-2022**	**----**	----	----	**11-Jan-2022**	24-Jan-2022	✓
0089_MW199_220110,	0089_MW195S_220110,							
0089_MW195D_220110,	0089_MW161_220110,							
0089_MW171_220110,	0089_MW200_220110,							
0089_MW203_220110,	0089_MW233_220110							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW124_220110, 0089_MW125_220110, 0089_MW199_220110, 0089_MW195S_220110, 0089_MW195D_220110, 0089_MW161_220110, 0089_MW171_220110, 0089_MW200_220110, 0089_MW203_220110, 0089_MW233_220110	**10-Jan-2022**	**----**	----	----	**18-Jan-2022**	07-Feb-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW124_220110, 0089_MW125_220110, 0089_MW199_220110, 0089_MW195S_220110, 0089_MW195D_220110, 0089_MW161_220110, 0089_MW171_220110, 0089_MW200_220110, 0089_MW203_220110, 0089_MW233_220110	**10-Jan-2022**	**----**	----	----	**18-Jan-2022**	07-Feb-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW124_220110, 0089_MW125_220110, 0089_MW199_220110, 0089_MW195S_220110, 0089_MW195D_220110, 0089_MW161_220110, 0089_MW171_220110, 0089_MW200_220110, 0089_MW203_220110, 0089_MW233_220110	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	17-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_220110, 0089_MW125_220110, 0089_MW199_220110, 0089_MW195S_220110, 0089_QC106_220110, 0089_MW195D_220110, 0089_MW161_220110, 0089_MW171_220110, 0089_MW200_220110, 0089_MW203_220110, 0089_MW233_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_220110, 0089_MW125_220110, 0089_MW199_220110, 0089_MW195S_220110, 0089_QC106_220110, 0089_MW195D_220110, 0089_MW161_220110, 0089_MW171_220110, 0089_MW200_220110, 0089_MW203_220110, 0089_MW233_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW124_220110, 0089_MW125_220110, 0089_MW199_220110, 0089_MW195S_220110, 0089_QC106_220110, 0089_MW195D_220110, 0089_MW161_220110, 0089_MW171_220110, 0089_MW200_220110, 0089_MW203_220110, 0089_MW233_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_220110, 0089_MW125_220110, 0089_MW199_220110, 0089_MW195S_220110, 0089_QC106_220110, 0089_MW195D_220110, 0089_MW161_220110, 0089_MW171_220110, 0089_MW200_220110, 0089_MW203_220110, 0089_MW233_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW124_220110, 0089_MW125_220110, 0089_MW199_220110, 0089_MW195S_220110, 0089_QC106_220110, 0089_MW195D_220110, 0089_MW161_220110, 0089_MW171_220110, 0089_MW200_220110, 0089_MW203_220110, 0089_MW233_220110	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**13-Jan-2022**	09-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	11	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: 32192 ALS Laboratory: EB Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AC

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD335		10/01/2022 09:00 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_QC103		10/01/2022 09:05 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD364		10/01/2022 09:23 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD340		10/01/2022 09:40 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
005	0089_SD369		10/01/2022 01:02 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
006	0089_SD345		10/01/2022 01:37 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

ALS COC#: 32192 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD335	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_QC103	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD364	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD340	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0089_SD369	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0089_SD345	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32192 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD335	HDPE Soil Jar	200 mL	00621019074579	Grey	No	
002	0089_QC103	HDPE Soil Jar	200 mL	00621019032793	Grey	No	
003	0089_SD364	HDPE Soil Jar	200 mL	00621019074692	Grey	No	
004	0089_SD340	HDPE Soil Jar	200 mL	00621019074597	Grey	No	
005	0089_SD369	HDPE Soil Jar	200 mL	00621019074701	Grey	No	
006	0089_SD345	HDPE Soil Jar	200 mL	00621019074654	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200217**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32192	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 09:45	Issue Date	: 11-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 15.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2200217-001	10-Jan-2022 09:00	0089_SD335_220110	✓	✓
EP2200217-002	10-Jan-2022 09:05	0089_QC103_220110	✓	✓
EP2200217-003	10-Jan-2022 09:23	0089_SD364_220110	✓	✓
EP2200217-004	10-Jan-2022 09:40	0089_SD340_220110	✓	✓
EP2200217-005	10-Jan-2022 13:02	0089_SD369_220110	✓	✓
EP2200217-006	10-Jan-2022 13:37	0089_SD345_220110	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200217**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 09:45
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32192	Issue Date	: 19-Jan-2022 13:39
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD335_220110	0089_QC103_220110	0089_SD364_220110	0089_SD340_220110	0089_SD369_220110
				Sampling date / time	10-Jan-2022 09:00	10-Jan-2022 09:05	10-Jan-2022 09:23	10-Jan-2022 09:40	10-Jan-2022 13:02
					EP2200217-001	EP2200217-002	EP2200217-003	EP2200217-004	EP2200217-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		<0.1	<0.1	<0.1	<0.1	<0.1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_220110	0089_QC103_220110	0089_SD364_220110	0089_SD340_220110	0089_SD369_220110
				Sampling date / time	10-Jan-2022 09:00	10-Jan-2022 09:05	10-Jan-2022 09:23	10-Jan-2022 09:40	10-Jan-2022 13:02
Compound	CAS Number	LOR	Unit		EP2200217-001	EP2200217-002	EP2200217-003	EP2200217-004	EP2200217-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**111**	**116**	**118**	**111**	**114**
13C8-PFOA	----	0.0002	%		**102**	**108**	**104**	**106**	**112**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD345_220110	----	----	----	----
				Sampling date / time	10-Jan-2022 13:37	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200217-006	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		<0.1	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD345_220110	----	----	----	----
				Sampling date / time	10-Jan-2022 13:37	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200217-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**112**	----	----	----	----
13C8-PFOA	----	0.0002	%		**113**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200217**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32192	Issue Date	: 19-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4122015)									
EP2200213-003	Anonymous	EA055: Moisture Content	----	0.1	%	<0.1	<0.1	0.0	No Limit
EP2200219-005	Anonymous	EA055: Moisture Content	----	0.1	%	<0.1	<0.1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2200219-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123756) - continued									
EP2200213-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2200219-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200219-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200219-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123756)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123756)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	78.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	124	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.5	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.0	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.1	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	87.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	106	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	112	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	114	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	100	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	100	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	102	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	111	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	78.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	106	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	127	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	114	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	119	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	111	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	106	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	101	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	93.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	90.5	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	97.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	96.5	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	108	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.4	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	107	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	97.6	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756) - continued							
EP2200213-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	88.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	122	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	92.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	115	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200217**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling SED AG	Issue Date	: 19-Jan-2022
Sampler	: [redacted]	No. of samples received	: 6
Order number	: DEF19009/730	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD335_220110, 0089_QC103_220110, 0089_SD364_220110, 0089_SD340_220110, 0089_SD369_220110, 0089_SD345_220110	**10-Jan-2022**	**----**	----	----	**14-Jan-2022**	24-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_220110, 0089_QC103_220110, 0089_SD364_220110, 0089_SD340_220110, 0089_SD369_220110, 0089_SD345_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_220110, 0089_QC103_220110, 0089_SD364_220110, 0089_SD340_220110, 0089_SD369_220110, 0089_SD345_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD335_220110, 0089_QC103_220110, 0089_SD364_220110, 0089_SD340_220110, 0089_SD369_220110, 0089_SD345_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_220110, 0089_QC103_220110, 0089_SD364_220110, 0089_SD340_220110, 0089_SD369_220110, 0089_SD345_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD335_220110, 0089_QC103_220110, 0089_SD364_220110, 0089_SD340_220110, 0089_SD369_220110, 0089_SD345_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 32212 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling SW/PW

ORDER NO: DEF19009/730

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW156		10/01/2022 11:32 AM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
002	0089_QC107		10/01/2022 11:34 AM	Water	ALS: 3 Non ALS: 0	No	X			Extra sample water for lab QC
003	0089_SW154		10/01/2022 11:35 AM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
004	0089_SW152		10/01/2022 11:36 AM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
005	0089_SW150		10/01/2022 11:37 AM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
006	0089_PW358		10/01/2022 12:13 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
007	0089_QC108		10/01/2022 12:16 PM	Water	ALS: 2 Non ALS: 0	No	X			
008	0089_PW329		10/01/2022 12:18 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
009	0089_PW330		10/01/2022 12:19 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 32212 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling SW/PW

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW331		10/01/2022 01:01 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
011	0089_PW356		10/01/2022 01:02 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
012	0089_PW357		10/01/2022 01:03 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
013	0089_QC301		10/01/2022 01:15 PM	Water	ALS: 2 Non ALS: 0	No	X			
014	0089_QC401		10/01/2022 01:15 PM	Water	ALS: 2 Non ALS: 0	No	X			
015	0089_QC302		10/01/2022 01:16 PM	Water	ALS: 2 Non ALS: 0	No	X			
016	0089_QC402		10/01/2022 01:17 PM	Water	ALS: 2 Non ALS: 0	No	X			
017	0089_QC303		10/01/2022 01:17 PM	Water	ALS: 2 Non ALS: 0	No	X			
018	0089_QC403		10/01/2022 01:18 PM	Water	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

(ALS) COC#: 32212 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling SW/PW

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW156	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW154	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW152	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW150	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW358	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_PW329	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW330	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_PW331	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_PW356	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **32212** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling SW/PW

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

012	0089_PW357	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32212 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling SW/PW

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW156	Clear Plastic Bottle - Natural	250 mL	00070621200262	Green	No	
001	0089_SW156	HDPE (no PTFE)	20 mL	00352101061786	Grey	No	
001	0089_SW156	HDPE (no PTFE)	20 mL	00352101061585	Grey	No	
002	0089_QC107	HDPE (no PTFE)	20 mL	00352101051729	Grey	No	
002	0089_QC107	HDPE (no PTFE)	20 mL	00352101051660	Grey	No	
002	0089_QC107	Clear Plastic Bottle - Natural	250 mL	00070621200938	Green	No	
003	0089_SW154	Clear Plastic Bottle - Natural	250 mL	00070621200490	Green	No	
003	0089_SW154	HDPE (no PTFE)	20 mL	00352101061758	Grey	No	
003	0089_SW154	HDPE (no PTFE)	20 mL	00352101061766	Grey	No	
004	0089_SW152	HDPE (no PTFE)	20 mL	00352101061602	Grey	No	
004	0089_SW152	HDPE (no PTFE)	20 mL	00352101061636	Grey	No	
004	0089_SW152	Clear Plastic Bottle - Natural	250 mL	00070621200517	Green	No	
005	0089_SW150	HDPE (no PTFE)	20 mL	00352101061624	Grey	No	
005	0089_SW150	HDPE (no PTFE)	20 mL	00352101061823	Grey	No	
005	0089_SW150	Clear Plastic Bottle - Natural	250 mL	00070621200280	Green	No	
006	0089_PW358	Clear Plastic Bottle - Natural	250 mL	00070621200505	Green	No	
006	0089_PW358	HDPE (no PTFE)	20 mL	00352101061614	Grey	No	
006	0089_PW358	HDPE (no PTFE)	20 mL	00352101061744	Grey	No	
007	0089_QC108	HDPE (no PTFE)	20 mL	00352101051692	Grey	No	
007	0089_QC108	HDPE (no PTFE)	20 mL	00352101051581	Grey	No	
008	0089_PW329	Clear Plastic Bottle - Natural	250 mL	00070621200965	Green	No	
008	0089_PW329	HDPE (no PTFE)	20 mL	00352101051610	Grey	No	
008	0089_PW329	HDPE (no PTFE)	20 mL	00352101051710	Grey	No	
009	0089_PW330	Clear Plastic Bottle - Natural	250 mL	00070621200290	Green	No	
009	0089_PW330	HDPE (no PTFE)	20 mL	00352101061838	Grey	No	
009	0089_PW330	HDPE (no PTFE)	20 mL	00352101061610	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 32212 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling SW/PW

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_PW331	Clear Plastic Bottle - Natural	250 mL	00070621200489	Green	No	
010	0089_PW331	HDPE (no PTFE)	20 mL	00352101061749	Grey	No	
010	0089_PW331	HDPE (no PTFE)	20 mL	00352101061681	Grey	No	
011	0089_PW356	Clear Plastic Bottle - Natural	250 mL	00070621200232	Green	No	
011	0089_PW356	HDPE (no PTFE)	20 mL	00352101061837	Grey	No	
011	0089_PW356	HDPE (no PTFE)	20 mL	00352101061562	Grey	No	
012	0089_PW357	Clear Plastic Bottle - Natural	250 mL	00070621200500	Green	No	
012	0089_PW357	HDPE (no PTFE)	20 mL	00352101061757	Grey	No	
012	0089_PW357	HDPE (no PTFE)	20 mL	00352101061782	Grey	No	
013	0089_QC301	HDPE (no PTFE)	20 mL	00352010040321	Grey	No	
013	0089_QC301	HDPE (no PTFE)	20 mL	00352010040431	Grey	No	
014	0089_QC401	HDPE (no PTFE)	20 mL	00352010040453	Grey	No	
014	0089_QC401	HDPE (no PTFE)	20 mL	00352010040494	Grey	No	
015	0089_QC302	HDPE (no PTFE)	20 mL	00350019011782	Grey	No	
015	0089_QC302	HDPE (no PTFE)	20 mL	00350019015180	Grey	No	
016	0089_QC402	HDPE (no PTFE)	20 mL	00352010040449	Grey	No	
016	0089_QC402	HDPE (no PTFE)	20 mL	00352010040299	Grey	No	
017	0089_QC303	HDPE (no PTFE)	20 mL	00350019035051	Grey	No	
017	0089_QC303	HDPE (no PTFE)	20 mL	00350019026877	Grey	No	
018	0089_QC403	HDPE (no PTFE)	20 mL	00352010040380	Grey	No	
018	0089_QC403	HDPE (no PTFE)	20 mL	00352010040429	Grey	No	

Total Bottle Count: ALS: 47, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200218**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32212	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: MB_DEF19009/Stirling SW/PW		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 09:45	Issue Date	: 11-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 15.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 18 / 18

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200218-001	10-Jan-2022 11:32	0089_SW156_220110	✓	✓	✓	✓
EP2200218-002	10-Jan-2022 11:34	0089_QC107_220110		✓		
EP2200218-003	10-Jan-2022 11:35	0089_SW154_220110	✓	✓	✓	✓
EP2200218-004	10-Jan-2022 11:36	0089_SW152_220110	✓	✓	✓	✓
EP2200218-005	10-Jan-2022 11:37	0089_SW150_220110	✓	✓	✓	✓
EP2200218-006	10-Jan-2022 12:13	0089_PW358_220110	✓	✓	✓	✓
EP2200218-007	10-Jan-2022 12:16	0089_QC108_220110		✓		
EP2200218-008	10-Jan-2022 12:18	0089_PW329_220110	✓	✓	✓	✓
EP2200218-009	10-Jan-2022 12:19	0089_PW330_220110	✓	✓	✓	✓
EP2200218-010	10-Jan-2022 13:01	0089_PW331_220110	✓	✓	✓	✓
EP2200218-011	10-Jan-2022 13:02	0089_PW356_220110	✓	✓	✓	✓
EP2200218-012	10-Jan-2022 13:03	0089_PW357_220110	✓	✓	✓	✓
EP2200218-013	10-Jan-2022 13:15	0089_QC301_220110		✓		
EP2200218-014	10-Jan-2022 13:15	0089_QC401_220110		✓		
EP2200218-015	10-Jan-2022 13:16	0089_QC302_220110		✓		
EP2200218-016	10-Jan-2022 13:17	0089_QC402_220110		✓		
EP2200218-017	10-Jan-2022 13:17	0089_QC303_220110		✓		
EP2200218-018	10-Jan-2022 13:18	0089_QC403_220110		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200218**	Page	: 1 of 14
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 09:45
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32212	Issue Date	: 18-Jan-2022 12:22
Sampler	: [redacted]		
Site	: MB_DEF19009/Stirling SW/PW		
Quote number	: SY/139/19		
No. of samples received	: 18		
No. of samples analysed	: 18		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW156_220110	0089_QC107_220110	0089_SW154_220110	0089_SW152_220110	0089_SW150_220110
				Sampling date / time	10-Jan-2022 11:32	10-Jan-2022 11:34	10-Jan-2022 11:35	10-Jan-2022 11:36	10-Jan-2022 11:37
Compound	CAS Number	LOR	Unit		EP2200218-001	EP2200218-002	EP2200218-003	EP2200218-004	EP2200218-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		120	----	120	138	120
Total Alkalinity as CaCO3	----	1	mg/L		120	----	120	138	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2400	----	2510	2500	2490
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19500	----	19000	19800	19800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		464	----	433	433	440
Magnesium	7439-95-4	1	mg/L		1500	----	1400	1400	1420
Sodium	7440-23-5	1	mg/L		12700	----	11700	11800	11900
Potassium	7440-09-7	1	mg/L		513	----	561	562	572
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		602	----	591	613	613
ø Total Cations	----	0.01	meq/L		712	----	660	664	671
ø Ionic Balance	----	0.01	%		8.34	----	5.55	4.00	4.54
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW156_220110	0089_QC107_220110	0089_SW154_220110	0089_SW152_220110	0089_SW150_220110
				Sampling date / time	10-Jan-2022 11:32	10-Jan-2022 11:34	10-Jan-2022 11:35	10-Jan-2022 11:36	10-Jan-2022 11:37
Compound	CAS Number	LOR	Unit		EP2200218-001	EP2200218-002	EP2200218-003	EP2200218-004	EP2200218-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW156_220110	0089_QC107_220110	0089_SW154_220110	0089_SW152_220110	0089_SW150_220110
				Sampling date / time	10-Jan-2022 11:32	10-Jan-2022 11:34	10-Jan-2022 11:35	10-Jan-2022 11:36	10-Jan-2022 11:37
Compound	CAS Number	LOR	Unit		EP2200218-001	EP2200218-002	EP2200218-003	EP2200218-004	EP2200218-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**105**	**103**	**102**	**103**
13C8-PFOA	----	0.02	%		**100**	**105**	**101**	**102**	**101**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW358_220110	0089_QC108_220110	0089_PW329_220110	0089_PW330_220110	0089_PW331_220110
				Sampling date / time	10-Jan-2022 12:13	10-Jan-2022 12:16	10-Jan-2022 12:18	10-Jan-2022 12:19	10-Jan-2022 13:01
Compound	CAS Number	LOR	Unit		EP2200218-006	EP2200218-007	EP2200218-008	EP2200218-009	EP2200218-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		148	----	178	144	135
Total Alkalinity as CaCO3	----	1	mg/L		148	----	178	144	135
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		3000	----	2940	2850	2750
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		22400	----	22800	21900	21700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		502	----	467	490	469
Magnesium	7439-95-4	1	mg/L		1640	----	1530	1620	1540
Sodium	7440-23-5	1	mg/L		13800	----	12800	13600	12800
Potassium	7440-09-7	1	mg/L		552	----	513	550	524
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		697	----	708	680	672
ø Total Cations	----	0.01	meq/L		774	----	719	763	720
ø Ionic Balance	----	0.01	%		5.24	----	0.78	5.78	3.46
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW358_220110	0089_QC108_220110	0089_PW329_220110	0089_PW330_220110	0089_PW331_220110
				Sampling date / time	10-Jan-2022 12:13	10-Jan-2022 12:16	10-Jan-2022 12:18	10-Jan-2022 12:19	10-Jan-2022 13:01
Compound	CAS Number	LOR	Unit		EP2200218-006	EP2200218-007	EP2200218-008	EP2200218-009	EP2200218-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW358_220110	0089_QC108_220110	0089_PW329_220110	0089_PW330_220110	0089_PW331_220110
				Sampling date / time	10-Jan-2022 12:13	10-Jan-2022 12:16	10-Jan-2022 12:18	10-Jan-2022 12:19	10-Jan-2022 13:01
Compound	CAS Number	LOR	Unit		EP2200218-006	EP2200218-007	EP2200218-008	EP2200218-009	EP2200218-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**102**	**109**	**108**	**106**
13C8-PFOA	----	0.02	%		**100**	**101**	**103**	**98.6**	**105**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW356_220110	0089_PW357_220110	0089_QC301_220110	0089_QC401_220110	0089_QC302_220110
				Sampling date / time	10-Jan-2022 13:02	10-Jan-2022 13:03	10-Jan-2022 13:15	10-Jan-2022 13:15	10-Jan-2022 13:16
Compound	CAS Number	LOR	Unit		EP2200218-011	EP2200218-012	EP2200218-013	EP2200218-014	EP2200218-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		165	120	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		165	120	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2850	2810	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		22100	21800	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		474	476	----	----	----
Magnesium	7439-95-4	1	mg/L		1580	1560	----	----	----
Sodium	7440-23-5	1	mg/L		13200	13200	----	----	----
Potassium	7440-09-7	1	mg/L		534	529	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		686	676	----	----	----
ø Total Cations	----	0.01	meq/L		742	740	----	----	----
ø Ionic Balance	----	0.01	%		3.88	4.52	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW356_220110	0089_PW357_220110	0089_QC301_220110	0089_QC401_220110	0089_QC302_220110
				Sampling date / time	10-Jan-2022 13:02	10-Jan-2022 13:03	10-Jan-2022 13:15	10-Jan-2022 13:15	10-Jan-2022 13:16
Compound	CAS Number	LOR	Unit		EP2200218-011	EP2200218-012	EP2200218-013	EP2200218-014	EP2200218-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW356_220110	0089_PW357_220110	0089_QC301_220110	0089_QC401_220110	0089_QC302_220110
				Sampling date / time	10-Jan-2022 13:02	10-Jan-2022 13:03	10-Jan-2022 13:15	10-Jan-2022 13:15	10-Jan-2022 13:16
					EP2200218-011	EP2200218-012	EP2200218-013	EP2200218-014	EP2200218-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	**109**	**111**	**99.6**	**113**
13C8-PFOA	----	0.02	%		**104**	**102**	**102**	**103**	**98.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC402_220110	0089_QC303_220110	0089_QC403_220110	----	----
				Sampling date / time	10-Jan-2022 13:17	10-Jan-2022 13:17	10-Jan-2022 13:18	----	----
Compound	CAS Number	LOR	Unit		EP2200218-016	EP2200218-017	EP2200218-018	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC402_220110	0089_QC303_220110	0089_QC403_220110	----	----
				Sampling date / time	10-Jan-2022 13:17	10-Jan-2022 13:17	10-Jan-2022 13:18	----	----
Compound	CAS Number	LOR	Unit		EP2200218-016	EP2200218-017	EP2200218-018	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**105**	**116**	----	----
13C8-PFOA	----	0.02	%		**102**	**98.9**	**101**	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200218**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 12-Jan-2022
C-O-C number	: 32212	Issue Date	: 18-Jan-2022
Sampler	: [redacted]		
Site	: MB_DEF19009/Stirling SW/PW		
Quote number	: SY/139/19		
No. of samples received	: 18		
No. of samples analysed	: 18		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4116618)									
EP2200214-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	434	428	1.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	434	428	1.4	0% - 20%
EP2200218-003	0089_SW154_220110	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	121	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	121	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4115034)									
EP2200216-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1680	1670	0.3	0% - 20%
EP2200218-001	0089_SW156_220110	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2400	2530	5.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4115033)									
EP2200216-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	13700	14200	3.8	0% - 20%
EP2200218-001	0089_SW156_220110	ED045G: Chloride	16887-00-6	1	mg/L	19500	19400	0.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4115205)									
EP2200218-001	0089_SW156_220110	ED093F: Calcium	7440-70-2	1	mg/L	464	437	5.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1500	1420	5.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12700	12000	5.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	513	568	10.1	0% - 20%
EP2200226-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	344	341	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1080	1080	0.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	8890	8880	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	411	408	0.8	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4116618)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	89.4	81.2	126
				<1	200 mg/L	100	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4115034)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.4	87.7	113
				<1	500 mg/L	101	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4115033)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	87.9	114
				<1	1000 mg/L	104	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4115205)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.3	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.7	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.2	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4118403)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	78.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	81.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	83.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	80.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	82.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4118403)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	94.6	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4118403) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	86.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	94.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4118403)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	85.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	96.5	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	89.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4118403)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	82.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	78.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	89.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	71.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4115034)							
EP2200216-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4115033)							
EP2200216-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200218**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: MB_DEF19009/Stirling SW/PW	Issue Date	: 18-Jan-2022
Sampler	: [redacted]	No. of samples received	: 18
Order number	: DEF19009/730	No. of samples analysed	: 18

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200216--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200216--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	18	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	18	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)		*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW156_220110,	0089_SW154_220110,	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	24-Jan-2022	✓
0089_SW152_220110,	0089_SW150_220110,							
0089_PW358_220110,	0089_PW329_220110,							
0089_PW330_220110,	0089_PW331_220110,							
0089_PW356_220110,	0089_PW357_220110							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW156_220110,	0089_SW154_220110,	**10-Jan-2022**	**----**	----	----	**18-Jan-2022**	07-Feb-2022	✓
0089_SW152_220110,	0089_SW150_220110,							
0089_PW358_220110,	0089_PW329_220110,							
0089_PW330_220110,	0089_PW331_220110,							
0089_PW356_220110,	0089_PW357_220110							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW156_220110,	0089_SW154_220110,	**10-Jan-2022**	**----**	----	----	**18-Jan-2022**	07-Feb-2022	✓
0089_SW152_220110,	0089_SW150_220110,							
0089_PW358_220110,	0089_PW329_220110,							
0089_PW330_220110,	0089_PW331_220110,							
0089_PW356_220110,	0089_PW357_220110							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW156_220110,	0089_SW154_220110,	**10-Jan-2022**	**----**	----	----	**12-Jan-2022**	17-Jan-2022	✓
0089_SW152_220110,	0089_SW150_220110,							
0089_PW358_220110,	0089_PW329_220110,							
0089_PW330_220110,	0089_PW331_220110,							
0089_PW356_220110,	0089_PW357_220110							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW156_220110,	0089_QC107_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**14-Jan-2022**	09-Jul-2022	✓
0089_SW154_220110,	0089_SW152_220110,							
0089_SW150_220110,	0089_PW358_220110,							
0089_QC108_220110,	0089_PW329_220110,							
0089_PW330_220110,	0089_PW331_220110,							
0089_PW356_220110,	0089_PW357_220110,							
0089_QC301_220110,	0089_QC401_220110,							
0089_QC302_220110,	0089_QC402_220110,							
0089_QC303_220110,	0089_QC403_220110							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW156_220110,	0089_QC107_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**14-Jan-2022**	09-Jul-2022	✓
0089_SW154_220110,	0089_SW152_220110,							
0089_SW150_220110,	0089_PW358_220110,							
0089_QC108_220110,	0089_PW329_220110,							
0089_PW330_220110,	0089_PW331_220110,							
0089_PW356_220110,	0089_PW357_220110,							
0089_QC301_220110,	0089_QC401_220110,							
0089_QC302_220110,	0089_QC402_220110,							
0089_QC303_220110,	0089_QC403_220110							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_SW156_220110,	0089_QC107_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**14-Jan-2022**	09-Jul-2022	✓
0089_SW154_220110,	0089_SW152_220110,							
0089_SW150_220110,	0089_PW358_220110,							
0089_QC108_220110,	0089_PW329_220110,							
0089_PW330_220110,	0089_PW331_220110,							
0089_PW356_220110,	0089_PW357_220110,							
0089_QC301_220110,	0089_QC401_220110,							
0089_QC302_220110,	0089_QC402_220110,							
0089_QC303_220110,	0089_QC403_220110							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW156_220110,	0089_QC107_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**14-Jan-2022**	09-Jul-2022	✓
0089_SW154_220110,	0089_SW152_220110,							
0089_SW150_220110,	0089_PW358_220110,							
0089_QC108_220110,	0089_PW329_220110,							
0089_PW330_220110,	0089_PW331_220110,							
0089_PW356_220110,	0089_PW357_220110,							
0089_QC301_220110,	0089_QC401_220110,							
0089_QC302_220110,	0089_QC402_220110,							
0089_QC303_220110,	0089_QC403_220110							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_SW156_220110,	0089_QC107_220110,	**10-Jan-2022**	**13-Jan-2022**	09-Jul-2022	✓	**14-Jan-2022**	09-Jul-2022	✓
0089_SW154_220110,	0089_SW152_220110,							
0089_SW150_220110,	0089_PW358_220110,							
0089_QC108_220110,	0089_PW329_220110,							
0089_PW330_220110,	0089_PW331_220110,							
0089_PW356_220110,	0089_PW357_220110,							
0089_QC301_220110,	0089_QC401_220110,							
0089_QC302_220110,	0089_QC402_220110,							
0089_QC303_220110,	0089_QC403_220110							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	18	0.00	10.00	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	18	0.00	5.00	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 32213 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling SED

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD358		10/01/2022 12:20 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_QC109		10/01/2022 12:21 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD329		10/01/2022 12:21 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD330		10/01/2022 12:22 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
005	0089_SD356		10/01/2022 01:04 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
006	0089_SD331		10/01/2022 01:04 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
007	0089_SD357		10/01/2022 01:04 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

(ALS) COC#: 32213 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling SED

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD358	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_QC109	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD330	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0089_SD356	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0089_SD331	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
007	0089_SD357	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32213 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: MB_DEF19009/Stirling SED

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD358	HDPE Soil Jar	200 mL	00621019083923	Grey	No	
002	0089_QC109	HDPE Soil Jar	200 mL	00621019083855	Grey	No	
003	0089_SD329	HDPE Soil Jar	200 mL	00621019083840	Grey	No	
004	0089_SD330	HDPE Soil Jar	200 mL	00621019083956	Grey	No	
005	0089_SD356	HDPE Soil Jar	200 mL	00621019083849	Grey	No	
006	0089_SD331	HDPE Soil Jar	200 mL	00621019083882	Grey	No	
007	0089_SD357	HDPE Soil Jar	200 mL	00621019083954	Grey	No	

Total Bottle Count: ALS: 7, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200219**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32213	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: MB_DEF19009/Stirling SED		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 09:45	Issue Date	: 12-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 15.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2200219-001	10-Jan-2022 12:20	0089_SD358_220110	✓	✓
EP2200219-002	10-Jan-2022 12:21	0089_QC109_220110	✓	✓
EP2200219-003	10-Jan-2022 12:21	0089_SD329_220110	✓	✓
EP2200219-004	10-Jan-2022 12:22	0089_SD330_220110	✓	✓
EP2200219-005	10-Jan-2022 13:04	0089_SD356_220110	✓	✓
EP2200219-006	10-Jan-2022 13:04	0089_SD331_220110	✓	✓
EP2200219-007	10-Jan-2022 13:04	0089_SD357_220110	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200219**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 09:45
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32213	Issue Date	: 19-Jan-2022 13:40
Sampler	: [redacted]		
Site	: MB_DEF19009/Stirling SED		
Quote number	: SY/139/19		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD358_220110	0089_QC109_220110	0089_SD329_220110	0089_SD330_220110	0089_SD356_220110
				Sampling date / time	10-Jan-2022 12:20	10-Jan-2022 12:21	10-Jan-2022 12:21	10-Jan-2022 12:22	10-Jan-2022 13:04
					EP2200219-001	EP2200219-002	EP2200219-003	EP2200219-004	EP2200219-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		<0.1	<0.1	<0.1	<0.1	<0.1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD358_220110	0089_QC109_220110	0089_SD329_220110	0089_SD330_220110	0089_SD356_220110
				Sampling date / time	10-Jan-2022 12:20	10-Jan-2022 12:21	10-Jan-2022 12:21	10-Jan-2022 12:22	10-Jan-2022 13:04
Compound	CAS Number	LOR	Unit		EP2200219-001	EP2200219-002	EP2200219-003	EP2200219-004	EP2200219-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		118	116	120	110	119
13C8-PFOA	----	0.0002	%		108	119	113	113	114

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD331_220110	0089_SD357_220110	----	----	----
			Sampling date / time	10-Jan-2022 13:04	10-Jan-2022 13:04	----	----	----
Compound	CAS Number	LOR	Unit	EP2200219-006	EP2200219-007	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	<0.1	<0.1	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD331_220110	0089_SD357_220110	----	----	----
				Sampling date / time	10-Jan-2022 13:04	10-Jan-2022 13:04	----	----	----
Compound	CAS Number	LOR	Unit		EP2200219-006	EP2200219-007	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**118**	**106**	----	----	----
13C8-PFOA	----	0.0002	%		**110**	**114**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200219**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32213	Issue Date	: 19-Jan-2022
Sampler	: [redacted]		
Site	: MB_DEF19009/Stirling SED		
Quote number	: SY/139/19		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4122015)									
EP2200213-003	Anonymous	EA055: Moisture Content	----	0.1	%	<0.1	<0.1	0.0	No Limit
EP2200219-005	0089_SD356_220110	EA055: Moisture Content	----	0.1	%	<0.1	<0.1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2200219-002	0089_QC109_220110	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123756) - continued									
EP2200213-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2200219-002	0089_QC109_220110	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200219-002	0089_QC109_220110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200219-002	0089_QC109_220110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123756)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123756)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	78.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	124	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.5	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.0	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.1	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	87.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	106	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	112	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	114	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	100	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	100	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	102	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	111	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	78.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	106	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	127	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	114	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	119	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	111	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	106	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	101	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	93.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	90.5	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	97.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	96.5	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	108	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.4	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	107	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	97.6	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756) - continued							
EP2200213-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	88.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	122	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	92.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	115	69.2	143

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200219**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: MB_DEF19009/Stirling SED	Issue Date	: 19-Jan-2022
Sampler	: [redacted]	No. of samples received	: 7
Order number	: DEF19009/730	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD358_220110, 0089_QC109_220110, 0089_SD329_220110, 0089_SD330_220110, 0089_SD356_220110, 0089_SD331_220110, 0089_SD357_220110	**10-Jan-2022**	**----**	----	----	**14-Jan-2022**	24-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD358_220110, 0089_QC109_220110, 0089_SD329_220110, 0089_SD330_220110, 0089_SD356_220110, 0089_SD331_220110, 0089_SD357_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD358_220110, 0089_QC109_220110, 0089_SD329_220110, 0089_SD330_220110, 0089_SD356_220110, 0089_SD331_220110, 0089_SD357_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD358_220110, 0089_QC109_220110, 0089_SD329_220110, 0089_SD330_220110, 0089_SD356_220110, 0089_SD331_220110, 0089_SD357_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD358_220110, 0089_QC109_220110, 0089_SD329_220110, 0089_SD330_220110, 0089_SD356_220110, 0089_SD331_220110, 0089_SD357_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD358_220110, 0089_QC109_220110, 0089_SD329_220110, 0089_SD330_220110, 0089_SD356_220110, 0089_SD331_220110, 0089_SD357_220110	**10-Jan-2022**	**17-Jan-2022**	09-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 32258 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS | **ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW380		11/01/2022 11:28 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW401		11/01/2022 11:28 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW350		11/01/2022 11:30 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW353		11/01/2022 11:31 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_SW383		11/01/2022 11:32 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_SW382		11/01/2022 11:33 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW381		11/01/2022 11:35 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_PW351		11/01/2022 11:36 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_SW384		11/01/2022 11:38 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 32258 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW352		11/01/2022 11:37 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089-PW367		11/01/2022 12:30 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra pfas bottles for lab qaqc
012	0089_QC113		11/01/2022 12:31 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
013	0089_SW321		11/01/2022 01:05 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_PW368		11/01/2022 01:06 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
015	0089_PW304		11/01/2022 01:07 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
016	0089_SW305		11/01/2022 01:08 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra pfas bottles for lab qaqc

CHAIN OF CUSTODY

(ALS) COC#: 32258 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW380	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW401	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW350	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW353	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW383	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW382	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW381	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_PW351	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_SW384	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32258 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_PW352	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089-PW367	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_QC113	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_SW321	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_PW368	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_PW304	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
016	0089_SW305	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 32258 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW380	Clear Plastic Bottle - Natural	250 mL	00070621200503	Green	No	
001	0089_PW380	HDPE (no PTFE)	20 mL	00352101061669	Grey	No	
001	0089_PW380	HDPE (no PTFE)	20 mL	00352101061638	Grey	No	
002	0089_PW401	Clear Plastic Bottle - Natural	250 mL	00070621200242	Green	No	
002	0089_PW401	HDPE (no PTFE)	20 mL	00352101061830	Grey	No	
002	0089_PW401	HDPE (no PTFE)	20 mL	00352101061541	Grey	No	
003	0089_PW350	Clear Plastic Bottle - Natural	250 mL	00070621199628	Green	No	
003	0089_PW350	HDPE (no PTFE)	20 mL	00352101051669	Grey	No	
003	0089_PW350	HDPE (no PTFE)	20 mL	00352101051565	Grey	No	
004	0089_SW353	Clear Plastic Bottle - Natural	250 mL	00070621200506	Green	No	
004	0089_SW353	HDPE (no PTFE)	20 mL	00352101061587	Grey	No	
004	0089_SW353	HDPE (no PTFE)	20 mL	00352101061688	Grey	No	
005	0089_SW383	Clear Plastic Bottle - Natural	250 mL	00070621200515	Green	No	
005	0089_SW383	HDPE (no PTFE)	20 mL	00352101051534	Grey	No	
005	0089_SW383	HDPE (no PTFE)	20 mL	00352101051650	Grey	No	
006	0089_SW382	HDPE (no PTFE)	20 mL	00352101061774	Grey	No	
006	0089_SW382	Clear Plastic Bottle - Natural	250 mL	00070621200303	Green	No	
006	0089_SW382	HDPE (no PTFE)	20 mL	00352101061640	Grey	No	
007	0089_PW381	HDPE (no PTFE)	20 mL	00352101051538	Grey	No	
007	0089_PW381	HDPE (no PTFE)	20 mL	00352101051647	Grey	No	
007	0089_PW381	Clear Plastic Bottle - Natural	250 mL	00070621200288	Green	No	
008	0089_PW351	Clear Plastic Bottle - Natural	250 mL	00070621200214	Green	No	
008	0089_PW351	HDPE (no PTFE)	20 mL	00352101051690	Grey	No	
008	0089_PW351	HDPE (no PTFE)	20 mL	00352101051720	Grey	No	
009	0089_SW384	Clear Plastic Bottle - Natural	250 mL	00070621200520	Green	No	
009	0089_SW384	HDPE (no PTFE)	20 mL	00352101061795	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 32258 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_SW384	HDPE (no PTFE)	20 mL	00352101061796	Grey	No	
010	0089_PW352	Clear Plastic Bottle - Natural	250 mL	00070621200455	Green	No	
010	0089_PW352	HDPE (no PTFE)	20 mL	00352101051611	Grey	No	
010	0089_PW352	HDPE (no PTFE)	20 mL	00352101051766	Grey	No	
011	0089-PW367	Clear Plastic Bottle - Natural	250 mL	00070621200293	Green	No	
011	0089-PW367	HDPE (no PTFE)	20 mL	00352101061569	Grey	No	
011	0089-PW367	HDPE (no PTFE)	20 mL	00352101061662	Grey	No	
011	0089-PW367	HDPE (no PTFE)	20 mL	00352101028220	Grey	No	
011	0089-PW367	HDPE (no PTFE)	20 mL	00352010010788	Grey	No	
012	0089_QC113	Clear Plastic Bottle - Natural	250 mL	00070621200272	Green	No	
012	0089_QC113	HDPE (no PTFE)	20 mL	00352101061727	Grey	No	
012	0089_QC113	HDPE (no PTFE)	20 mL	00352101061790	Grey	No	
013	0089_SW321	Clear Plastic Bottle - Natural	250 mL	00070621200502	Green	No	
013	0089_SW321	HDPE (no PTFE)	20 mL	00352101061734	Grey	No	
013	0089_SW321	HDPE (no PTFE)	20 mL	00352101061806	Grey	No	
014	0089_PW368	Clear Plastic Bottle - Natural	250 mL	00070621200299	Green	No	
014	0089_PW368	HDPE (no PTFE)	20 mL	00352101061596	Grey	No	
014	0089_PW368	HDPE (no PTFE)	20 mL	00352101061826	Grey	No	
015	0089_PW304	Clear Plastic Bottle - Natural	250 mL	00070621200301	Green	No	
015	0089_PW304	HDPE (no PTFE)	20 mL	00352101061665	Grey	No	
015	0089_PW304	HDPE (no PTFE)	20 mL	00352101061642	Grey	No	
016	0089_SW305	HDPE (no PTFE)	20 mL	00352101061701	Grey	No	
016	0089_SW305	HDPE (no PTFE)	20 mL	00352101061772	Grey	No	
016	0089_SW305	HDPE (no PTFE)	20 mL	00352101061836	Grey	No	
016	0089_SW305	HDPE (no PTFE)	20 mL	00352101061643	Grey	No	
016	0089_SW305	Clear Plastic Bottle - Natural	250 mL	00070621200311	Green	No	

Total Bottle Count: ALS: 52, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200240**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32258	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 15:45	Issue Date	: 12-Jan-2022
Client Requested Due Date	: 21-Jan-2022	Scheduled Reporting Date	: **21-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 2.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 16 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200240-001	11-Jan-2022 11:28	0089_PW380_220111	✓	✓	✓	✓
EP2200240-002	11-Jan-2022 11:28	0089_PW401_220111	✓	✓	✓	✓
EP2200240-003	11-Jan-2022 11:30	0089_PW350_220111	✓	✓	✓	✓
EP2200240-004	11-Jan-2022 11:31	0089_SW353_220111	✓	✓	✓	✓
EP2200240-005	11-Jan-2022 11:32	0089_SW383_220111	✓	✓	✓	✓
EP2200240-006	11-Jan-2022 11:33	0089_SW382_220111	✓	✓	✓	✓
EP2200240-007	11-Jan-2022 11:35	0089_PW381_220111	✓	✓	✓	✓
EP2200240-008	11-Jan-2022 11:36	0089_PW351_220111	✓	✓	✓	✓
EP2200240-009	11-Jan-2022 11:38	0089_SW384_220111	✓	✓	✓	✓
EP2200240-010	11-Jan-2022 11:37	0089_PW352_220111	✓	✓	✓	✓
EP2200240-011	11-Jan-2022 12:30	0089-PW367_220111	✓	✓	✓	✓
EP2200240-012	11-Jan-2022 12:31	0089_QC113_220111		✓		
EP2200240-013	11-Jan-2022 13:05	0089_SW321_220111	✓	✓	✓	✓
EP2200240-014	11-Jan-2022 13:06	0089_PW368_220111	✓	✓	✓	✓
EP2200240-015	11-Jan-2022 13:07	0089_PW304_220111	✓	✓	✓	✓
EP2200240-016	11-Jan-2022 13:08	0089_SW305_220111	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200240**	Page	: 1 of 15
Amendment	: **1**		
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 15:45
Order number	: DEF19009/730	Date Analysis Commenced	: 13-Jan-2022
C-O-C number	: 32258	Issue Date	: 19-Jan-2022 13:47
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19		
No. of samples received	: 16		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Amendment (19/01/2022): This report has been amended as a result of a request to change sample matrix type on a different batch in a connected run. All analysis results are as per the previous report.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW353_220111	0089_SW383_220111	0089_SW382_220111	0089_SW321_220111	0089_SW305_220111
				Sampling date / time	11-Jan-2022 11:31	11-Jan-2022 11:32	11-Jan-2022 11:33	11-Jan-2022 13:05	11-Jan-2022 13:08
Compound	CAS Number	LOR	Unit		EP2200240-004	EP2200240-005	EP2200240-006	EP2200240-013	EP2200240-016
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		121	120	115	127	132
Total Alkalinity as CaCO3	----	1	mg/L		121	120	115	127	132
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2560	2590	2590	2550	2450
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19700	19800	19800	19000	19200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		424	438	429	430	416
Magnesium	7439-95-4	1	mg/L		1390	1430	1400	1400	1350
Sodium	7440-23-5	1	mg/L		11100	11500	11200	11200	10700
Potassium	7440-09-7	1	mg/L		500	522	505	505	484
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		611	615	615	592	595
ø Total Cations	----	0.01	meq/L		631	653	637	637	610
ø Ionic Balance	----	0.01	%		1.59	3.02	1.75	3.68	1.20
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	0.06	0.04
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW353_220111	0089_SW383_220111	0089_SW382_220111	0089_SW321_220111	0089_SW305_220111
				Sampling date / time	11-Jan-2022 11:31	11-Jan-2022 11:32	11-Jan-2022 11:33	11-Jan-2022 13:05	11-Jan-2022 13:08
Compound	CAS Number	LOR	Unit		EP2200240-004	EP2200240-005	EP2200240-006	EP2200240-013	EP2200240-016
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW353_220111	0089_SW383_220111	0089_SW382_220111	0089_SW321_220111	0089_SW305_220111
				Sampling date / time	11-Jan-2022 11:31	11-Jan-2022 11:32	11-Jan-2022 11:33	11-Jan-2022 13:05	11-Jan-2022 13:08
					EP2200240-004	EP2200240-005	EP2200240-006	EP2200240-013	EP2200240-016
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.06**	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.06**	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.06**	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**107**	**103**	**111**	**109**
13C8-PFOA	----	0.02	%		**112**	**106**	**102**	**109**	**116**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW380_220111	0089_PW401_220111	0089_PW350_220111	0089_PW381_220111	0089_PW351_220111
				Sampling date / time	11-Jan-2022 11:28	11-Jan-2022 11:28	11-Jan-2022 11:30	11-Jan-2022 11:35	11-Jan-2022 11:36
Compound	CAS Number	LOR	Unit		EP2200240-001	EP2200240-002	EP2200240-003	EP2200240-007	EP2200240-008
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		114	114	112	118	119
Total Alkalinity as CaCO3	----	1	mg/L		114	114	112	118	119
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2600	2620	2620	2600	2510
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19500	19800	19900	19800	19900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		430	426	427	420	428
Magnesium	7439-95-4	1	mg/L		1450	1410	1410	1380	1400
Sodium	7440-23-5	1	mg/L		11600	11300	11300	11000	11300
Potassium	7440-09-7	1	mg/L		522	510	510	499	505
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		606	615	618	615	616
ø Total Cations	----	0.01	meq/L		659	642	642	626	641
ø Ionic Balance	----	0.01	%		4.13	2.11	1.89	0.87	1.99
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW380_220111	0089_PW401_220111	0089_PW350_220111	0089_PW381_220111	0089_PW351_220111
				Sampling date / time	11-Jan-2022 11:28	11-Jan-2022 11:28	11-Jan-2022 11:30	11-Jan-2022 11:35	11-Jan-2022 11:36
Compound	CAS Number	LOR	Unit		EP2200240-001	EP2200240-002	EP2200240-003	EP2200240-007	EP2200240-008
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW380_220111	0089_PW401_220111	0089_PW350_220111	0089_PW381_220111	0089_PW351_220111
				Sampling date / time	11-Jan-2022 11:28	11-Jan-2022 11:28	11-Jan-2022 11:30	11-Jan-2022 11:35	11-Jan-2022 11:36
					EP2200240-001	EP2200240-002	EP2200240-003	EP2200240-007	EP2200240-008
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	**111**	**114**	**105**	**102**
13C8-PFOA	----	0.02	%		**108**	**106**	**108**	**111**	**113**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_SW384_220111	0089_PW352_220111	0089-PW367_220111	0089_QC113_220111	0089_PW368_220111
				Sampling date / time	11-Jan-2022 11:38	11-Jan-2022 11:37	11-Jan-2022 12:30	11-Jan-2022 12:31	11-Jan-2022 13:06
Compound	CAS Number	LOR	Unit		EP2200240-009	EP2200240-010	EP2200240-011	EP2200240-012	EP2200240-014
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**119**	**115**	**718**	----	**195**
Total Alkalinity as CaCO3	----	1	mg/L		**119**	**115**	**718**	----	**195**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2660**	**2640**	**2490**	----	**1240**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19500**	**19400**	**21000**	----	**8810**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**421**	**442**	**554**	----	**206**
Magnesium	7439-95-4	1	mg/L		**1380**	**1450**	**1520**	----	**623**
Sodium	7440-23-5	1	mg/L		**11000**	**11600**	**12100**	----	**4820**
Potassium	7440-09-7	1	mg/L		**498**	**522**	**550**	----	**226**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**608**	**604**	**658**	----	**278**
ø Total Cations	----	0.01	meq/L		**626**	**659**	**693**	----	**277**
ø Ionic Balance	----	0.01	%		**1.46**	**4.34**	**2.56**	----	**0.22**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	**0.06**	**0.07**	**0.07**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_SW384_220111	0089_PW352_220111	0089-PW367_220111	0089_QC113_220111	0089_PW368_220111
				Sampling date / time	11-Jan-2022 11:38	11-Jan-2022 11:37	11-Jan-2022 12:30	11-Jan-2022 12:31	11-Jan-2022 13:06
Compound	CAS Number	LOR	Unit		EP2200240-009	EP2200240-010	EP2200240-011	EP2200240-012	EP2200240-014
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_SW384_220111	0089_PW352_220111	0089-PW367_220111	0089_QC113_220111	0089_PW368_220111
				Sampling date / time	11-Jan-2022 11:38	11-Jan-2022 11:37	11-Jan-2022 12:30	11-Jan-2022 12:31	11-Jan-2022 13:06
Compound	CAS Number	LOR	Unit		EP2200240-009	EP2200240-010	EP2200240-011	EP2200240-012	EP2200240-014
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**0.06**	**0.07**	**0.07**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.06**	**0.07**	**0.07**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.06**	**0.07**	**0.07**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	**117**	**102**	**110**	**102**
13C8-PFOA	----	0.02	%		**108**	**111**	**106**	**111**	**111**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW304_220111	----	----	----	----
				Sampling date / time	11-Jan-2022 13:07	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200240-015	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**244**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**244**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2720**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20000**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**432**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1420**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11400**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**527**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**626**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**648**	----	----	----	----
ø Ionic Balance	----	0.01	%		**1.73**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.09**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW304_220111	----	----	----	----
				Sampling date / time	11-Jan-2022 13:07	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200240-015	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW304_220111	----	----	----	----
				Sampling date / time	11-Jan-2022 13:07	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200240-015	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.09**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.09**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.09**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	----	----	----	----
13C8-PFOA	----	0.02	%		**106**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200240**	Page	: 1 of 7
Amendment	: **1**		
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 13-Jan-2022
C-O-C number	: 32258	Issue Date	: 19-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19		
No. of samples received	: 16		
No. of samples analysed	: 16		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4118437)									
EP2200240-002	0089_PW401_220111	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	114	114	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	114	114	0.0	0% - 20%
EP2200240-013	0089_SW321_220111	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	127	124	2.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	127	124	2.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4119091)									
EP2200240-001	0089_PW380_220111	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2600	2690	3.4	0% - 20%
EP2200240-011	0089-PW367_220111	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2490	2510	0.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4119090)									
EP2200240-001	0089_PW380_220111	ED045G: Chloride	16887-00-6	1	mg/L	19500	19700	0.8	0% - 20%
EP2200240-011	0089-PW367_220111	ED045G: Chloride	16887-00-6	1	mg/L	21000	21000	0.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4117431)									
EP2200240-001	0089_PW380_220111	ED093F: Calcium	7440-70-2	1	mg/L	430	424	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1450	1400	3.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11600	11200	3.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	522	507	3.0	0% - 20%
EP2200240-011	0089-PW367_220111	ED093F: Calcium	7440-70-2	1	mg/L	554	569	2.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1560	3.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12100	12600	4.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	550	573	4.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4121279)									
EP2200240-011	0089-PW367_220111	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4121279)									
EP2200240-011	0089-PW367_220111	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4121279)									
EP2200240-011	0089-PW367_220111	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4121279)									
EP2200240-011	0089-PW367_220111	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4121279) - continued									
EP2200240-011	0089-PW367_220111	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4121279)									
EP2200240-011	0089-PW367_220111	EP231X: Sum of PFAS	----	0.01	µg/L	0.06	0.06	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4118437)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	81.2	126
				<1	200 mg/L	99.6	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4119091)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.1	87.7	113
				<1	500 mg/L	100	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4119090)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	87.9	114
				<1	1000 mg/L	104	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4117431)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.6	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.1	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121279)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	90.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	81.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	82.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	92.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	83.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	95.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121279)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	80.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	83.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	82.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	80.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	83.4	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121279) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	89.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4121279)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	78.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	80.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.6	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.5	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	78.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	77.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	77.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4121279)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	82.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	85.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	83.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	80.4	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4119091)							
EP2200240-001	0089_PW380_220111	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4119090)							
EP2200240-001	0089_PW380_220111	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121279)							
EP2200240-016	0089_SW305_220111	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	101	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	93.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	93.6	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	101	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121279) - continued							
EP2200240-016	0089_SW305_220111	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	96.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121279)							
EP2200240-016	0089_SW305_220111	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	80.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	81.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	112	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	110	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	95.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	89.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	91.0	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	91.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	95.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4121279)							
EP2200240-016	0089_SW305_220111	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	95.8	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	105	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.3	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	82.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	86.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4121279)							
EP2200240-016	0089_SW305_220111	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	90.4	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	87.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	92.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	84.0	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200240**	Page	: 1 of 6
Amendment	: **1**		
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling SW/PW - AG	Issue Date	: 19-Jan-2022
Sampler	: [redacted]	No. of samples received	: 16
Order number	: DEF19009/730	No. of samples analysed	: 16

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200240--001	0089_PW380_220111	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200240--001	0089_PW380_220111	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW380_220111, 0089_PW401_220111, 0089_PW350_220111, 0089_SW353_220111, 0089_SW383_220111, 0089_SW382_220111, 0089_PW381_220111, 0089_PW351_220111, 0089_SW384_220111, 0089_PW352_220111, 0089-PW367_220111, 0089_SW321_220111, 0089_PW368_220111, 0089_PW304_220111, 0089_SW305_220111	**11-Jan-2022**	**----**	----	----	**13-Jan-2022**	25-Jan-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW380_220111, 0089_PW401_220111, 0089_PW350_220111, 0089_SW353_220111, 0089_SW383_220111, 0089_SW382_220111, 0089_PW381_220111, 0089_PW351_220111, 0089_SW384_220111, 0089_PW352_220111, 0089-PW367_220111, 0089_SW321_220111, 0089_PW368_220111, 0089_PW304_220111, 0089_SW305_220111	**11-Jan-2022**	**----**	----	----	**17-Jan-2022**	08-Feb-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW380_220111, 0089_PW401_220111, 0089_PW350_220111, 0089_SW353_220111, 0089_SW383_220111, 0089_SW382_220111, 0089_PW381_220111, 0089_PW351_220111, 0089_SW384_220111, 0089_PW352_220111, 0089-PW367_220111, 0089_SW321_220111, 0089_PW368_220111, 0089_PW304_220111, 0089_SW305_220111	**11-Jan-2022**	**----**	----	----	**17-Jan-2022**	08-Feb-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW380_220111, 0089_PW401_220111, 0089_PW350_220111, 0089_SW353_220111, 0089_SW383_220111, 0089_SW382_220111, 0089_PW381_220111, 0089_PW351_220111, 0089_SW384_220111, 0089_PW352_220111, 0089-PW367_220111, 0089_SW321_220111, 0089_PW368_220111, 0089_PW304_220111, 0089_SW305_220111	**11-Jan-2022**	**----**	----	----	**13-Jan-2022**	18-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW380_220111, 0089_PW401_220111, 0089_PW350_220111, 0089_SW353_220111, 0089_SW383_220111, 0089_SW382_220111, 0089_PW381_220111, 0089_PW351_220111, 0089_SW384_220111, 0089_PW352_220111, 0089-PW367_220111, 0089_QC113_220111, 0089_SW321_220111, 0089_PW368_220111, 0089_PW304_220111, 0089_SW305_220111	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW380_220111,	0089_PW401_220111,	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓
0089_PW350_220111,	0089_SW353_220111,							
0089_SW383_220111,	0089_SW382_220111,							
0089_PW381_220111,	0089_PW351_220111,							
0089_SW384_220111,	0089_PW352_220111,							
0089-PW367_220111,	0089_QC113_220111,							
0089_SW321_220111,	0089_PW368_220111,							
0089_PW304_220111,	0089_SW305_220111							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_PW380_220111,	0089_PW401_220111,	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓
0089_PW350_220111,	0089_SW353_220111,							
0089_SW383_220111,	0089_SW382_220111,							
0089_PW381_220111,	0089_PW351_220111,							
0089_SW384_220111,	0089_PW352_220111,							
0089-PW367_220111,	0089_QC113_220111,							
0089_SW321_220111,	0089_PW368_220111,							
0089_PW304_220111,	0089_SW305_220111							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW380_220111,	0089_PW401_220111,	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓
0089_PW350_220111,	0089_SW353_220111,							
0089_SW383_220111,	0089_SW382_220111,							
0089_PW381_220111,	0089_PW351_220111,							
0089_SW384_220111,	0089_PW352_220111,							
0089-PW367_220111,	0089_QC113_220111,							
0089_SW321_220111,	0089_PW368_220111,							
0089_PW304_220111,	0089_SW305_220111							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_PW380_220111,	0089_PW401_220111,	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓
0089_PW350_220111,	0089_SW353_220111,							
0089_SW383_220111,	0089_SW382_220111,							
0089_PW381_220111,	0089_PW351_220111,							
0089_SW384_220111,	0089_PW352_220111,							
0089-PW367_220111,	0089_QC113_220111,							
0089_SW321_220111,	0089_PW368_220111,							
0089_PW304_220111,	0089_SW305_220111							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: 32278 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND.REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW259		11/01/2022 11:53 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW518		11/01/2022 12:18 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_MW268		11/01/2022 12:52 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW261		11/01/2022 01:18 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW010		11/01/2022 01:19 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW269		11/01/2022 02:08 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_QC301		11/01/2022 02:10 PM	Water	ALS: 2 Non ALS: 0	No		X		
008	0089_QC302		11/01/2022 02:11 PM	Water	ALS: 2 Non ALS: 0	No		X		
009	0089_QC401		11/01/2022 02:12 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 32278 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC402		11/01/2022 02:12 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 32278 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW259	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW518	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW268	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW261	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW010	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW269	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32278 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW259	HDPE (no PTFE)	20 mL	00352101061593	Grey	No	
001	0089_MW259	HDPE (no PTFE)	20 mL	00352101061611	Grey	No	
001	0089_MW259	Clear Plastic Bottle - Natural	250 mL	00070621200565	Green	No	
002	0089_MW518	Clear Plastic Bottle - Natural	250 mL	00070621200560	Green	No	
002	0089_MW518	HDPE (no PTFE)	20 mL	00352101061829	Grey	No	
002	0089_MW518	HDPE (no PTFE)	20 mL	00352101061579	Grey	No	
003	0089_MW268	HDPE (no PTFE)	20 mL	00352101061647	Grey	No	
003	0089_MW268	HDPE (no PTFE)	20 mL	00352101061798	Grey	No	
003	0089_MW268	Clear Plastic Bottle - Natural	250 mL	00070621199619	Green	No	
004	0089_MW261	Clear Plastic Bottle - Natural	250 mL	00070621200276	Green	No	
004	0089_MW261	HDPE (no PTFE)	20 mL	00352101061740	Grey	No	
004	0089_MW261	HDPE (no PTFE)	20 mL	00352101061789	Grey	No	
005	0089_MW010	Clear Plastic Bottle - Natural	250 mL	00070621200266	Green	No	
005	0089_MW010	HDPE (no PTFE)	20 mL	00352101061617	Grey	No	
005	0089_MW010	HDPE (no PTFE)	20 mL	00352101061564	Grey	No	
006	0089_MW269	Clear Plastic Bottle - Natural	250 mL	00070621200484	Green	No	
006	0089_MW269	HDPE (no PTFE)	20 mL	00352101061622	Grey	No	
006	0089_MW269	HDPE (no PTFE)	20 mL	00352101061825	Grey	No	
007	0089_QC301	HDPE (no PTFE)	20 mL	00352101061606	Grey	No	
007	0089_QC301	HDPE (no PTFE)	20 mL	00352101061666	Grey	No	
008	0089_QC302	HDPE (no PTFE)	20 mL	00352101061546	Grey	No	
008	0089_QC302	HDPE (no PTFE)	20 mL	00352101061785	Grey	No	
009	0089_QC401	HDPE (no PTFE)	20 mL	00352101061631	Grey	No	
009	0089_QC401	HDPE (no PTFE)	20 mL	00352101061817	Grey	No	
010	0089_QC402	HDPE (no PTFE)	20 mL	00352101061582	Grey	No	
010	0089_QC402	HDPE (no PTFE)	20 mL	00352101061746	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 32278 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

Total Bottle Count: ALS: 26, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200241**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32278	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 15:45	Issue Date	: 12-Jan-2022
Client Requested Due Date	: 21-Jan-2022	Scheduled Reporting Date	: **21-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 2.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200241-001	11-Jan-2022 11:53	0089_MW259_220111	✓	✓	✓	✓
EP2200241-002	11-Jan-2022 12:18	0089_MW518_220111	✓	✓	✓	✓
EP2200241-003	11-Jan-2022 12:52	0089_MW268_220111	✓	✓	✓	✓
EP2200241-004	11-Jan-2022 13:18	0089_MW261_220111	✓	✓	✓	✓
EP2200241-005	11-Jan-2022 13:19	0089_MW010_220111	✓	✓	✓	✓
EP2200241-006	11-Jan-2022 14:08	0089_MW269_220111	✓	✓	✓	✓
EP2200241-007	11-Jan-2022 14:10	0089_QC301_220111		✓		
EP2200241-008	11-Jan-2022 14:11	0089_QC302_220111		✓		
EP2200241-009	11-Jan-2022 14:12	0089_QC401_220111		✓		
EP2200241-010	11-Jan-2022 14:12	0089_QC402_220111		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200241**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 15:45
Order number	: DEF19009/730	Date Analysis Commenced	: 13-Jan-2022
C-O-C number	: 32278	Issue Date	: 18-Jan-2022 09:25
Sampler	: [redacted]		
Site	: DEF19009/Stirling GW JS		
Quote number	: SY/139/19		
No. of samples received	: 10		
No. of samples analysed	: 10		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW259_220111	0089_MW518_220111	0089_MW268_220111	0089_MW261_220111	0089_MW010_220111
				Sampling date / time	11-Jan-2022 11:53	11-Jan-2022 12:18	11-Jan-2022 12:52	11-Jan-2022 13:18	11-Jan-2022 13:19
Compound	CAS Number	LOR	Unit		EP2200241-001	EP2200241-002	EP2200241-003	EP2200241-004	EP2200241-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		170	365	411	337	349
Total Alkalinity as CaCO3	----	1	mg/L		170	365	411	337	349
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		6	196	868	67	87
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20	385	667	119	124
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		55	119	210	94	83
Magnesium	7439-95-4	1	mg/L		8	63	204	15	15
Sodium	7440-23-5	1	mg/L		10	185	388	76	109
Potassium	7440-09-7	1	mg/L		<1	18	19	17	10
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		4.08	22.2	45.1	11.5	12.3
ø Total Cations	----	0.01	meq/L		3.84	19.6	44.6	9.66	10.4
ø Ionic Balance	----	0.01	%		3.13	6.22	0.52	8.60	8.43
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.07	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.07	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.02	0.41	0.05	0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.13	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW259_220111	0089_MW518_220111	0089_MW268_220111	0089_MW261_220111	0089_MW010_220111
				Sampling date / time	11-Jan-2022 11:53	11-Jan-2022 12:18	11-Jan-2022 12:52	11-Jan-2022 13:18	11-Jan-2022 13:19
Compound	CAS Number	LOR	Unit		EP2200241-001	EP2200241-002	EP2200241-003	EP2200241-004	EP2200241-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW259_220111	0089_MW518_220111	0089_MW268_220111	0089_MW261_220111	0089_MW010_220111
				Sampling date / time	11-Jan-2022 11:53	11-Jan-2022 12:18	11-Jan-2022 12:52	11-Jan-2022 13:18	11-Jan-2022 13:19
					EP2200241-001	EP2200241-002	EP2200241-003	EP2200241-004	EP2200241-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.15**	**0.02**	**0.55**	**0.05**	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.13**	**0.02**	**0.41**	**0.05**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.15**	**0.02**	**0.48**	**0.05**	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	**107**	**101**	**110**	**104**
13C8-PFOA	----	0.02	%		**111**	**115**	**111**	**111**	**111**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_220111	0089_QC301_220111	0089_QC302_220111	0089_QC401_220111	0089_QC402_220111
				Sampling date / time	11-Jan-2022 14:08	11-Jan-2022 14:10	11-Jan-2022 14:11	11-Jan-2022 14:12	11-Jan-2022 14:12
Compound	CAS Number	LOR	Unit		EP2200241-006	EP2200241-007	EP2200241-008	EP2200241-009	EP2200241-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**386**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**386**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**106**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**287**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**98**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**47**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**153**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**12**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**18.0**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**15.7**	----	----	----	----
ø Ionic Balance	----	0.01	%		**6.80**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.02**	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.24**	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.02**	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.22**	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.05**	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_220111	0089_QC301_220111	0089_QC302_220111	0089_QC401_220111	0089_QC402_220111
				Sampling date / time	11-Jan-2022 14:08	11-Jan-2022 14:10	11-Jan-2022 14:11	11-Jan-2022 14:12	11-Jan-2022 14:12
Compound	CAS Number	LOR	Unit		EP2200241-006	EP2200241-007	EP2200241-008	EP2200241-009	EP2200241-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_220111	0089_QC301_220111	0089_QC302_220111	0089_QC401_220111	0089_QC402_220111
				Sampling date / time	11-Jan-2022 14:08	11-Jan-2022 14:10	11-Jan-2022 14:11	11-Jan-2022 14:12	11-Jan-2022 14:12
Compound	CAS Number	LOR	Unit		EP2200241-006	EP2200241-007	EP2200241-008	EP2200241-009	EP2200241-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.59**	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.46**	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.53**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	**113**	**108**	**109**	**112**
13C8-PFOA	----	0.02	%		**112**	**110**	**110**	**111**	**118**

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200241**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 13-Jan-2022
C-O-C number	: 32278	Issue Date	: 18-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW JS		
Quote number	: SY/139/19		
No. of samples received	: 10		
No. of samples analysed	: 10		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4119080)									
EP2200241-002	0089_MW518_220111	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	365	372	1.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	365	372	1.8	0% - 20%
EP2200306-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4119087)									
EP2200212-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2560	2570	0.4	0% - 20%
EP2200215-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2820	2790	1.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4119086)									
EP2200212-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19600	19700	0.4	0% - 20%
EP2200215-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	22000	22100	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4117431)									
EP2200240-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	430	424	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1450	1400	3.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11600	11200	3.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	522	507	3.0	0% - 20%
EP2200240-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	554	569	2.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1560	3.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12100	12600	4.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	550	573	4.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4117432)									
EP2200241-006	0089_MW269_220111	ED093F: Calcium	7440-70-2	1	mg/L	98	100	1.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	47	48	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	153	154	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	12	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4121279)									
EP2200240-011	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4121279)									
EP2200240-011	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4121279)									
EP2200240-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4121279)									
EP2200240-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4121279) - continued									
EP2200240-011	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4121279)									
EP2200240-011	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.06	0.06	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4119080)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	103	81.2	126
				<1	200 mg/L	100	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4119087)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	108	87.7	113
				<1	500 mg/L	105	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4119086)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	87.9	114
				<1	1000 mg/L	107	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4117431)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.6	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.1	89.7	108
ED093F: Dissolved Major Cations (QCLot: 4117432)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.2	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.2	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121279)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	90.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	81.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	82.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	92.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	83.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	95.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121280)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	85.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	88.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	87.8	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121280) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	84.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121279)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	80.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	83.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	82.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	80.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	81.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	83.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	89.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121280)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	81.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	77.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	84.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	94.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4121279)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	78.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	80.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.6	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.5	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	78.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	77.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	77.6	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4121280)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	91.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	91.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	100	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	103	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4121279)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	82.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	85.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	83.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	80.4	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4121280)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	84.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	91.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	89.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	88.0	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4119087)							
EP2200212-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4119086)							
EP2200212-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121279)							
EP2200240-016	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	101	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	93.0	71.0	127

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121279) - continued							
EP2200240-016	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	93.6	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	96.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121279)							
EP2200240-016	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	80.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	81.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	112	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	110	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	95.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	89.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	91.0	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	91.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	95.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4121279)							
EP2200240-016	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	95.8	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	105	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.3	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	82.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	86.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4121279)							
EP2200240-016	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	90.4	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	87.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	92.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	84.0	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200241**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling GW JS	Issue Date	: 18-Jan-2022
Sampler	: [redacted]	No. of samples received	: 10
Order number	: DEF19009/730	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200212--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200212--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	26	3.85	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	26	3.85	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW259_220111, 0089_MW518_220111, 0089_MW268_220111, 0089_MW261_220111, 0089_MW010_220111, 0089_MW269_220111	**11-Jan-2022**	**----**	----	----	**13-Jan-2022**	25-Jan-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW259_220111, 0089_MW518_220111, 0089_MW268_220111, 0089_MW261_220111, 0089_MW010_220111, 0089_MW269_220111	**11-Jan-2022**	**----**	----	----	**17-Jan-2022**	08-Feb-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW259_220111, 0089_MW518_220111, 0089_MW268_220111, 0089_MW261_220111, 0089_MW010_220111, 0089_MW269_220111	**11-Jan-2022**	**----**	----	----	**17-Jan-2022**	08-Feb-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW259_220111, 0089_MW518_220111, 0089_MW268_220111, 0089_MW261_220111, 0089_MW010_220111, 0089_MW269_220111	**11-Jan-2022**	**----**	----	----	**13-Jan-2022**	18-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW259_220111, 0089_MW518_220111, 0089_MW268_220111, 0089_MW261_220111, 0089_MW010_220111, 0089_MW269_220111, 0089_QC301_220111, 0089_QC302_220111, 0089_QC401_220111, 0089_QC402_220111	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW259_220111, 0089_MW518_220111, 0089_MW268_220111, 0089_MW261_220111, 0089_MW010_220111, 0089_MW269_220111, 0089_QC301_220111, 0089_QC302_220111, 0089_QC401_220111, 0089_QC402_220111	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW259_220111, 0089_MW518_220111, 0089_MW268_220111, 0089_MW261_220111, 0089_MW010_220111, 0089_MW269_220111, 0089_QC301_220111, 0089_QC302_220111, 0089_QC401_220111, 0089_QC402_220111	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW259_220111, 0089_MW518_220111, 0089_MW268_220111, 0089_MW261_220111, 0089_MW010_220111, 0089_MW269_220111, 0089_QC301_220111, 0089_QC302_220111, 0089_QC401_220111, 0089_QC402_220111	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW259_220111,	0089_MW518_220111,	**11-Jan-2022**	**14-Jan-2022**	10-Jul-2022	✓	**17-Jan-2022**	10-Jul-2022	✓
0089_MW268_220111,	0089_MW261_220111,							
0089_MW010_220111,	0089_MW269_220111,							
0089_QC301_220111,	0089_QC302_220111,							
0089_QC401_220111,	0089_QC402_220111							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	21	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	26	**3.85**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	26	**3.85**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: **32285** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD367		11/01/2022 12:29 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_QC114		11/01/2022 12:29 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD368		11/01/2022 01:10 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD304		11/01/2022 01:10 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

COC#: 32285 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD367	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_QC114	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD368	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD304	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32285 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD367	HDPE Soil Jar	200 mL	00621019074609	Grey	No	
002	0089_QC114	HDPE Soil Jar	200 mL	00621019074657	Grey	No	
003	0089_SD368	HDPE Soil Jar	200 mL	00621019074610	Grey	No	
004	0089_SD304	HDPE Soil Jar	200 mL	00621019074592	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200242**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32285	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 15:45	Issue Date	: 12-Jan-2022
Client Requested Due Date	: 20-Jan-2022	Scheduled Reporting Date	: **20-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 2.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2200242-001	11-Jan-2022 12:29	0089_SD367_220111	✓	✓
EP2200242-002	11-Jan-2022 12:29	0089_QC114_220111	✓	✓
EP2200242-003	11-Jan-2022 13:10	0089_SD368_220111	✓	✓
EP2200242-004	11-Jan-2022 13:10	0089_SD304_220111	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200242**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 15:45
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32285	Issue Date	: 19-Jan-2022 13:40
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19		
No. of samples received	: 4		
No. of samples analysed	: 4		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD367_220111	0089_QC114_220111	0089_SD368_220111	0089_SD304_220111	----
			Sampling date / time	11-Jan-2022 12:29	11-Jan-2022 12:29	11-Jan-2022 13:10	11-Jan-2022 13:10	----
Compound	CAS Number	LOR	Unit	EP2200242-001	EP2200242-002	EP2200242-003	EP2200242-004	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**39.3**	**43.4**	**31.1**	**42.7**	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0004**	**0.0004**	**0.0004**	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_220111	0089_QC114_220111	0089_SD368_220111	0089_SD304_220111	----
				Sampling date / time	11-Jan-2022 12:29	11-Jan-2022 12:29	11-Jan-2022 13:10	11-Jan-2022 13:10	----
Compound	CAS Number	LOR	Unit		EP2200242-001	EP2200242-002	EP2200242-003	EP2200242-004	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0004**	**0.0004**	**0.0004**	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0004**	**0.0004**	**0.0004**	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0004**	**0.0004**	**0.0004**	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**118**	**105**	**111**	**116**	----
13C8-PFOA	----	0.0002	%		**114**	**118**	**112**	**108**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200242**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32285	Issue Date	: 19-Jan-2022
Sampler	: [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19		
No. of samples received	: 4		
No. of samples analysed	: 4		

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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4122015)									
EP2200213-003	Anonymous	EA055: Moisture Content	----	0.1	%	<0.1	<0.1	0.0	No Limit
EP2200219-005	Anonymous	EA055: Moisture Content	----	0.1	%	<0.1	<0.1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2200219-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123756) - continued									
EP2200213-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2200219-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200219-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4123756)									
EP2200213-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200219-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123756)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123756)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	78.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	124	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.5	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.0	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.1	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	87.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	106	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	112	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	114	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	100	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	100	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	102	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	111	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	78.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	106	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	127	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	114	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	119	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	111	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	106	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	101	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	93.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	90.5	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	97.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	96.5	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	108	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.4	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	107	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	97.6	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123756) - continued							
EP2200213-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123756)							
EP2200213-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	88.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	122	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	92.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	115	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200242**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling SED AG	Issue Date	: 19-Jan-2022
Sampler	: [redacted]	No. of samples received	: 4
Order number	: DEF19009/730	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD367_220111, 0089_QC114_220111, 0089_SD368_220111, 0089_SD304_220111	**11-Jan-2022**	**----**	----	----	**14-Jan-2022**	25-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_220111, 0089_QC114_220111, 0089_SD368_220111, 0089_SD304_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_220111, 0089_QC114_220111, 0089_SD368_220111, 0089_SD304_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD367_220111, 0089_QC114_220111, 0089_SD368_220111, 0089_SD304_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_220111, 0089_QC114_220111, 0089_SD368_220111, 0089_SD304_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD367_220111, 0089_QC114_220111, 0089_SD368_220111, 0089_SD304_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 32257 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD352		11/01/2022 09:04 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_SD381		11/01/2022 09:05 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD351		11/01/2022 09:06 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD401		11/01/2022 09:07 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

ALS COC#: 32257 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD352	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_SD381	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD351	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD401	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32257 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD352	HDPE Soil Jar	200 mL	00621019083856	Grey	No	
002	0089_SD381	HDPE Soil Jar	200 mL	00621019083967	Grey	No	
003	0089_SD351	HDPE Soil Jar	200 mL	00621019083919	Grey	No	
004	0089_SD401	HDPE Soil Jar	200 mL	00621019083879	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200279**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32257	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED JS		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 11-Jan-2022 15:45	Issue Date	: 12-Jan-2022
Client Requested Due Date	: 21-Jan-2022	Scheduled Reporting Date	: **21-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 2.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2200279-001	11-Jan-2022 09:04	0089_SD352_220111	✓	✓
EP2200279-002	11-Jan-2022 09:05	0089_SD381_220111	✓	✓
EP2200279-003	11-Jan-2022 09:06	0089_SD351_220111	✓	✓
EP2200279-004	11-Jan-2022 09:07	0089_SD401_220111	✓	✓
EP2200279-005	11-Jan-2022 09:07	0089_SD380_220111	✓	✓
EP2200279-006	11-Jan-2022 09:07	0089_SD350_220111	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200279**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022 15:45
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32257	Issue Date	: 20-Jan-2022 17:22
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED JS		
Quote number	: SY/139/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD352_220111	0089_SD381_220111	0089_SD351_220111	0089_SD401_220111	0089_SD380_220111
			Sampling date / time	11-Jan-2022 09:04	11-Jan-2022 09:05	11-Jan-2022 09:06	11-Jan-2022 09:07	11-Jan-2022 09:07
Compound	CAS Number	LOR	Unit	EP2200279-001	EP2200279-002	EP2200279-003	EP2200279-004	EP2200279-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**25.2**	**20.8**	**26.8**	**25.6**	**27.0**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD352_220111	0089_SD381_220111	0089_SD351_220111	0089_SD401_220111	0089_SD380_220111
				Sampling date / time	11-Jan-2022 09:04	11-Jan-2022 09:05	11-Jan-2022 09:06	11-Jan-2022 09:07	11-Jan-2022 09:07
Compound	CAS Number	LOR	Unit		EP2200279-001	EP2200279-002	EP2200279-003	EP2200279-004	EP2200279-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**115**	**110**	**118**	**104**	**113**
13C8-PFOA	----	0.0002	%		**110**	**110**	**110**	**108**	**111**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD350_220111	----	----	----	----
			Sampling date / time	11-Jan-2022 09:07	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2200279-006	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**22.0**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD350_220111	----	----	----	----
				Sampling date / time	11-Jan-2022 09:07	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200279-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	----	----	----	----
13C8-PFOA	----	0.0002	%		**103**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200279**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32257	Issue Date	: 20-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED JS		
Quote number	: SY/139/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4122016)									
EP2200279-003	0089_SD351_220111	EA055: Moisture Content	----	0.1	%	26.8	26.6	0.6	0% - 20%
ME2200075-001	Anonymous	EA055: Moisture Content	----	0.1	%	16.0	15.6	3.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4123787)									
EP2200279-001	0089_SD352_220111	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2200291-033	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0005	0.0006	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0044	0.0047	8.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123787)									
EP2200279-001	0089_SD352_220111	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4123787) - continued									
EP2200279-001	0089_SD352_220111	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2200291-033	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4123787)									
EP2200279-001	0089_SD352_220111	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200291-033	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4123787)									
EP2200279-001	0089_SD352_220111	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200291-033	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123787)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123787)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	82.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.0	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123787)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.8	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.7	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123787)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	101	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	119	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123787) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	91.6	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4123787)							
EP2200279-001	0089_SD352_220111	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	124	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	103	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	99.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	106	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	109	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	116	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4123787)							
EP2200279-001	0089_SD352_220111	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	77.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	98.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	120	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	112	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	121	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	110	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	109	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	106	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	104	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	101	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	93.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123787)							
EP2200279-001	0089_SD352_220111	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	102	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	94.4	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	92.1	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	102	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	108	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4123787) - continued							
EP2200279-001	0089_SD352_220111	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	105	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4123787)							
EP2200279-001	0089_SD352_220111	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	99.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	98.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	126	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	89.2	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200279**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 11-Jan-2022
Site	: DEF19009/Stirling SED JS	Issue Date	: 20-Jan-2022
Sampler	: [redacted]	No. of samples received	: 6
Order number	: DEF19009/730	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD352_220111, 0089_SD381_220111, 0089_SD351_220111, 0089_SD401_220111, 0089_SD380_220111, 0089_SD350_220111	**11-Jan-2022**	**----**	----	----	**14-Jan-2022**	25-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD352_220111, 0089_SD381_220111, 0089_SD351_220111, 0089_SD401_220111, 0089_SD380_220111, 0089_SD350_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD352_220111, 0089_SD381_220111, 0089_SD351_220111, 0089_SD401_220111, 0089_SD380_220111, 0089_SD350_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD352_220111, 0089_SD381_220111, 0089_SD351_220111, 0089_SD401_220111, 0089_SD380_220111, 0089_SD350_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD352_220111, 0089_SD381_220111, 0089_SD351_220111, 0089_SD401_220111, 0089_SD380_220111, 0089_SD350_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD352_220111, 0089_SD381_220111, 0089_SD351_220111, 0089_SD401_220111, 0089_SD380_220111, 0089_SD350_220111	**11-Jan-2022**	**17-Jan-2022**	10-Jul-2022	✓	**18-Jan-2022**	26-Feb-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

(ALS) COC#: 32313 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY: [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 3:40 pm 12/01/22.	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW243		12/01/2022 08:35 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW240		12/01/2022 08:45 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_QC115		12/01/2022 09:02 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW238		12/01/2022 09:10 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW239		12/01/2022 09:24 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW245	Extra pfas bottles for lab internal qc	12/01/2022 09:46 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			
007	0089_MW202		12/01/2022 10:25 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_MW288		12/01/2022 11:04 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
009	0089_MW242		12/01/2022 12:36 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

ALS COC#: 32313 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW249		12/01/2022 01:01 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
011	0089_MW248		12/01/2022 01:13 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
012	0089_MW516		12/01/2022 01:30 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
013	0089_QC301		12/01/2022 01:32 PM	Water	ALS: 2 Non ALS: 0	No		X		
014	0089_QC401		12/01/2022 01:33 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 32313 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW243	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW240	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_QC115	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW238	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW239	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW245	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW202	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW288	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW242	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32313 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_MW249	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW248	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW516	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 32313 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW243	Clear Plastic Bottle - Natural	250 mL	00070621200258	Green	No	
001	0089_MW243	HDPE (no PTFE)	20 mL	00352101061628	Grey	No	
001	0089_MW243	HDPE (no PTFE)	20 mL	00352101061722	Grey	No	
002	0089_MW240	HDPE (no PTFE)	20 mL	00352101061567	Grey	No	
002	0089_MW240	Clear Plastic Bottle - Natural	250 mL	00070621200532	Green	No	
002	0089_MW240	HDPE (no PTFE)	20 mL	00352101061646	Grey	No	
003	0089_QC115	Clear Plastic Bottle - Natural	250 mL	00070621200523	Green	No	
003	0089_QC115	HDPE (no PTFE)	20 mL	00352101061822	Grey	No	
003	0089_QC115	HDPE (no PTFE)	20 mL	00352101061748	Grey	No	
004	0089_MW238	Clear Plastic Bottle - Natural	250 mL	00070621200546	Green	No	
004	0089_MW238	HDPE (no PTFE)	20 mL	00352101061712	Grey	No	
004	0089_MW238	HDPE (no PTFE)	20 mL	00352101061828	Grey	No	
005	0089_MW239	HDPE (no PTFE)	20 mL	00352101061733	Grey	No	
005	0089_MW239	HDPE (no PTFE)	20 mL	00352101061612	Grey	No	
005	0089_MW239	Clear Plastic Bottle - Natural	250 mL	00070621200482	Green	No	
006	0089_MW245	Clear Plastic Bottle - Natural	250 mL	00070621200291	Green	No	
006	0089_MW245	HDPE (no PTFE)	20 mL	00352101061729	Grey	No	
006	0089_MW245	HDPE (no PTFE)	20 mL	00352101061802	Grey	No	
006	0089_MW245	HDPE (no PTFE)	20 mL	00352101061781	Grey	No	
006	0089_MW245	HDPE (no PTFE)	20 mL	00352101061717	Grey	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00352101061682	Grey	No	
007	0089_MW202	Clear Plastic Bottle - Natural	250 mL	00070621200545	Green	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00352101061542	Grey	No	
008	0089_MW288	Clear Plastic Bottle - Natural	250 mL	00070621199633	Green	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00352101061831	Grey	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00352101061618	Grey	No	

CHAIN OF CUSTODY

COC#: **32313** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW242	Clear Plastic Bottle - Natural	250 mL	00070621200527	Green	No	
009	0089_MW242	HDPE (no PTFE)	20 mL	00352101061597	Grey	No	
009	0089_MW242	HDPE (no PTFE)	20 mL	00352101061745	Grey	No	
010	0089_MW249	HDPE (no PTFE)	20 mL	00352101061674	Grey	No	
010	0089_MW249	Clear Plastic Bottle - Natural	250 mL	00070621200526	Green	No	
010	0089_MW249	HDPE (no PTFE)	20 mL	00352101061698	Grey	No	
011	0089_MW248	Clear Plastic Bottle - Natural	250 mL	00070621200480	Green	No	
011	0089_MW248	HDPE (no PTFE)	20 mL	00352101061594	Grey	No	
011	0089_MW248	HDPE (no PTFE)	20 mL	00352101061545	Grey	No	
012	0089_MW516	HDPE (no PTFE)	20 mL	00352101061644	Grey	No	
012	0089_MW516	Clear Plastic Bottle - Natural	250 mL	00070621200300	Green	No	
012	0089_MW516	HDPE (no PTFE)	20 mL	00352101061566	Grey	No	
013	0089_QC301	HDPE (no PTFE)	20 mL	00352101061630	Grey	No	
013	0089_QC301	HDPE (no PTFE)	20 mL	00352101061560	Grey	No	
014	0089_QC401	HDPE (no PTFE)	20 mL	00352101061573	Grey	No	
014	0089_QC401	HDPE (no PTFE)	20 mL	00352101061601	Grey	No	

Total Bottle Count: ALS: 42, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200288**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32313	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Jan-2022 15:40	Issue Date	: 14-Jan-2022
Client Requested Due Date	: 24-Jan-2022	Scheduled Reporting Date	: **18-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 19.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 14 / 14

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200288-001	12-Jan-2022 08:35	0089_MW243_220112	✓	✓	✓	✓
EP2200288-002	12-Jan-2022 08:45	0089_MW240_220112	✓	✓	✓	✓
EP2200288-003	12-Jan-2022 09:02	0089_QC115_220112	✓	✓		✓
EP2200288-004	12-Jan-2022 09:10	0089_MW238_220112	✓	✓	✓	✓
EP2200288-005	12-Jan-2022 09:24	0089_MW239_220112	✓	✓	✓	✓
EP2200288-006	12-Jan-2022 09:46	0089_MW245_220112	✓	✓	✓	✓
EP2200288-007	12-Jan-2022 10:25	0089_MW202_220112	✓	✓	✓	✓
EP2200288-008	12-Jan-2022 11:04	0089_MW288_220112	✓	✓	✓	✓
EP2200288-009	12-Jan-2022 12:36	0089_MW242_220112	✓	✓	✓	✓
EP2200288-010	12-Jan-2022 13:01	0089_MW249_220112	✓	✓	✓	✓
EP2200288-011	12-Jan-2022 13:13	0089_MW248_220112	✓	✓	✓	✓
EP2200288-012	12-Jan-2022 13:30	0089_MW516_220112	✓	✓	✓	✓
EP2200288-013	12-Jan-2022 13:32	0089_QC301_220112		✓		
EP2200288-014	12-Jan-2022 13:33	0089_QC401_220112		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200288**	Page	: 1 of 12
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 12-Jan-2022 15:40
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32313	Issue Date	: 20-Jan-2022 16:03
Sampler	: [redacted]		
Site	: DEF19009/Stirling GW JS		
Quote number	: SY/139/19		
No. of samples received	: 14		
No. of samples analysed	: 14		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- ED041/45G: Sulfate and Chloride results for EP2200288 #1-3 have been confirmed by re-preparation and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_220112	0089_MW240_220112	0089_QC115_220112	0089_MW238_220112	0089_MW239_220112
				Sampling date / time	12-Jan-2022 08:35	12-Jan-2022 08:45	12-Jan-2022 09:02	12-Jan-2022 09:10	12-Jan-2022 09:24
Compound	CAS Number	LOR	Unit		EP2200288-001	EP2200288-002	EP2200288-003	EP2200288-004	EP2200288-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		246	299	259	193	213
Total Alkalinity as CaCO3	----	1	mg/L		246	299	259	193	213
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		33	58	38	40	49
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		55	53	35	41	28
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		106	108	----	81	75
Magnesium	7439-95-4	1	mg/L		14	12	----	14	13
Sodium	7440-23-5	1	mg/L		30	28	----	24	20
Potassium	7440-09-7	1	mg/L		4	3	----	3	2
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		7.15	8.68	6.95	5.84	6.06
ø Total Cations	----	0.01	meq/L		7.85	7.67	6.50	6.31	5.73
ø Ionic Balance	----	0.01	%		4.63	6.15	3.35	3.86	2.82
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.07	0.69	0.69	0.02	0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.06	0.06	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_220112	0089_MW240_220112	0089_QC115_220112	0089_MW238_220112	0089_MW239_220112
				Sampling date / time	12-Jan-2022 08:35	12-Jan-2022 08:45	12-Jan-2022 09:02	12-Jan-2022 09:10	12-Jan-2022 09:24
Compound	CAS Number	LOR	Unit		EP2200288-001	EP2200288-002	EP2200288-003	EP2200288-004	EP2200288-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW243_220112	0089_MW240_220112	0089_QC115_220112	0089_MW238_220112	0089_MW239_220112
				Sampling date / time	12-Jan-2022 08:35	12-Jan-2022 08:45	12-Jan-2022 09:02	12-Jan-2022 09:10	12-Jan-2022 09:24
					EP2200288-001	EP2200288-002	EP2200288-003	EP2200288-004	EP2200288-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.09**	**0.75**	**0.75**	**0.02**	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.09**	**0.69**	**0.69**	**0.02**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.09**	**0.75**	**0.75**	**0.02**	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	**111**	**110**	**115**	**106**
13C8-PFOA	----	0.02	%		**99.8**	**104**	**97.6**	**100**	**98.1**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW245_220112	0089_MW202_220112	0089_MW288_220112	0089_MW242_220112	0089_MW249_220112
				Sampling date / time	12-Jan-2022 09:46	12-Jan-2022 10:25	12-Jan-2022 11:04	12-Jan-2022 12:36	12-Jan-2022 13:01
Compound	CAS Number	LOR	Unit		EP2200288-006	EP2200288-007	EP2200288-008	EP2200288-009	EP2200288-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		342	344	254	194	431
Total Alkalinity as CaCO3	----	1	mg/L		342	344	254	194	431
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<1	64	56	26	40
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		34	198	53	15	118
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		98	93	84	59	85
Magnesium	7439-95-4	1	mg/L		10	28	22	10	36
Sodium	7440-23-5	1	mg/L		22	119	51	12	82
Potassium	7440-09-7	1	mg/L		3	12	5	1	7
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		7.79	13.8	7.74	4.84	12.8
ø Total Cations	----	0.01	meq/L		6.75	12.4	8.35	4.31	11.0
ø Ionic Balance	----	0.01	%		7.19	5.20	3.81	5.74	7.68
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.03	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.03	0.12	<0.01	0.15
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.09	0.05	4.50	0.02	0.11
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	0.07	<0.02	0.04
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW245_220112	0089_MW202_220112	0089_MW288_220112	0089_MW242_220112	0089_MW249_220112
				Sampling date / time	12-Jan-2022 09:46	12-Jan-2022 10:25	12-Jan-2022 11:04	12-Jan-2022 12:36	12-Jan-2022 13:01
Compound	CAS Number	LOR	Unit		EP2200288-006	EP2200288-007	EP2200288-008	EP2200288-009	EP2200288-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW245_220112	0089_MW202_220112	0089_MW288_220112	0089_MW242_220112	0089_MW249_220112
				Sampling date / time	12-Jan-2022 09:46	12-Jan-2022 10:25	12-Jan-2022 11:04	12-Jan-2022 12:36	12-Jan-2022 13:01
Compound	CAS Number	LOR	Unit		EP2200288-006	EP2200288-007	EP2200288-008	EP2200288-009	EP2200288-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.09**	**0.08**	**4.74**	**0.02**	**0.30**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.09**	**0.08**	**4.62**	**0.02**	**0.26**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.09**	**0.08**	**4.71**	**0.02**	**0.30**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**115**	**114**	**102**	**114**	**111**
13C8-PFOA	----	0.02	%		**103**	**103**	**99.1**	**99.4**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW248_220112	0089_MW516_220112	0089_QC301_220112	0089_QC401_220112	----
				Sampling date / time	12-Jan-2022 13:13	12-Jan-2022 13:30	12-Jan-2022 13:32	12-Jan-2022 13:33	----
Compound	CAS Number	LOR	Unit		EP2200288-011	EP2200288-012	EP2200288-013	EP2200288-014	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**524**	**482**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**524**	**482**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**93**	**42**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**406**	**122**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**144**	**108**	----	----	----
Magnesium	7439-95-4	1	mg/L		**59**	**42**	----	----	----
Sodium	7440-23-5	1	mg/L		**183**	**84**	----	----	----
Potassium	7440-09-7	1	mg/L		**16**	**11**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**23.8**	**13.9**	----	----	----
ø Total Cations	----	0.01	meq/L		**20.4**	**12.8**	----	----	----
ø Ionic Balance	----	0.01	%		**7.79**	**4.36**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.13**	**0.09**	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.10**	**0.05**	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.07**	**1.18**	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.06**	**0.08**	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.38**	**9.40**	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.38**	**0.14**	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.04**	**0.02**	<0.02	<0.02	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW248_220112	0089_MW516_220112	0089_QC301_220112	0089_QC401_220112	----
				Sampling date / time	12-Jan-2022 13:13	12-Jan-2022 13:30	12-Jan-2022 13:32	12-Jan-2022 13:33	----
Compound	CAS Number	LOR	Unit		EP2200288-011	EP2200288-012	EP2200288-013	EP2200288-014	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.06**	**0.08**	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW248_220112	0089_MW516_220112	0089_QC301_220112	0089_QC401_220112	----
				Sampling date / time	12-Jan-2022 13:13	12-Jan-2022 13:30	12-Jan-2022 13:32	12-Jan-2022 13:33	----
Compound	CAS Number	LOR	Unit		EP2200288-011	EP2200288-012	EP2200288-013	EP2200288-014	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**3.26**	**11.0**	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.45**	**10.6**	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**3.10**	**10.9**	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**108**	**109**	**110**	----
13C8-PFOA	----	0.02	%		**95.9**	**100**	**102**	**98.6**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200288**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 12-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32313	Issue Date	: 20-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW JS		
Quote number	: SY/139/19		
No. of samples received	: 14		
No. of samples analysed	: 14		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4120588)									
EP2200288-002	0089_MW240_220112	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	299	298	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	299	298	0.3	0% - 20%
EP2200288-012	0089_MW516_220112	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	482	492	2.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	482	492	2.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4121747)									
EP2200288-001	0089_MW243_220112	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	33	34	0.0	0% - 20%
EP2200288-011	0089_MW248_220112	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	93	93	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4121746)									
EP2200288-001	0089_MW243_220112	ED045G: Chloride	16887-00-6	1	mg/L	55	55	0.0	0% - 20%
EP2200288-011	0089_MW248_220112	ED045G: Chloride	16887-00-6	1	mg/L	406	406	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4120393)									
EP2200288-001	0089_MW243_220112	ED093F: Calcium	7440-70-2	1	mg/L	106	106	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	30	30	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EP2200288-011	0089_MW248_220112	ED093F: Calcium	7440-70-2	1	mg/L	144	143	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	183	182	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	16	16	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4121610)									
EP2200288-006	0089_MW245_220112	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	0.09	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4121610)									
EP2200288-006	0089_MW245_220112	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4121610)									
EP2200288-006	0089_MW245_220112	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4121610)									
EP2200288-006	0089_MW245_220112	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4121610) - continued									
EP2200288-006	0089_MW245_220112	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4121610)									
EP2200288-006	0089_MW245_220112	EP231X: Sum of PFAS	----	0.01	µg/L	0.09	0.10	10.5	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4120588)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	81.2	126
				<1	200 mg/L	98.1	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4121747)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.8	87.7	113
				<1	500 mg/L	100	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4121746)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	87.9	114
				<1	1000 mg/L	104	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4120393)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.4	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.1	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.3	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121610)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	78.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	83.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	82.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	84.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121610)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	83.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121610) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	91.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4121610)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	81.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	83.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4121610)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	93.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	83.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	80.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	88.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4121747)							
EP2200288-001	0089_MW243_220112	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	82.6	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4121746)							
EP2200288-001	0089_MW243_220112	ED045G: Chloride	16887-00-6	1000 mg/L	105	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121610)							
EP2200289-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	99.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	87.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	93.2	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	87.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	92.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	80.8	53.0	142

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121610)							
EP2200289-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	105	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	102	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	120	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	106	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	96.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	89.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	92.8	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	92.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	101	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	86.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4121610)							
EP2200289-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	100	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	99.1	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	92.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	100	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	84.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	95.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4121610)							
EP2200289-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	96.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	90.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	96.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	85.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200288**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 12-Jan-2022
Site	: DEF19009/Stirling GW JS	Issue Date	: 20-Jan-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 14
Order number	: DEF19009/730	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	18	5.56	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW243_220112,	0089_MW240_220112,	**12-Jan-2022**	**----**	----	----	**14-Jan-2022**	26-Jan-2022	✓
0089_QC115_220112,	0089_MW238_220112,							
0089_MW239_220112,	0089_MW245_220112,							
0089_MW202_220112,	0089_MW288_220112,							
0089_MW242_220112,	0089_MW249_220112,							
0089_MW248_220112,	0089_MW516_220112							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW243_220112,	0089_MW240_220112,	**12-Jan-2022**	**----**	----	----	**17-Jan-2022**	09-Feb-2022	✓
0089_QC115_220112,	0089_MW238_220112,							
0089_MW239_220112,	0089_MW245_220112,							
0089_MW202_220112,	0089_MW288_220112,							
0089_MW242_220112,	0089_MW249_220112,							
0089_MW248_220112,	0089_MW516_220112							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW243_220112,	0089_MW240_220112,	**12-Jan-2022**	**----**	----	----	**17-Jan-2022**	09-Feb-2022	✓
0089_QC115_220112,	0089_MW238_220112,							
0089_MW239_220112,	0089_MW245_220112,							
0089_MW202_220112,	0089_MW288_220112,							
0089_MW242_220112,	0089_MW249_220112,							
0089_MW248_220112,	0089_MW516_220112							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW243_220112, 0089_MW240_220112, 0089_MW238_220112, 0089_MW239_220112, 0089_MW245_220112, 0089_MW202_220112, 0089_MW288_220112, 0089_MW242_220112, 0089_MW249_220112, 0089_MW248_220112, 0089_MW516_220112	**12-Jan-2022**	**----**	----	----	**14-Jan-2022**	19-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW243_220112, 0089_MW240_220112, 0089_QC115_220112, 0089_MW238_220112, 0089_MW239_220112, 0089_MW245_220112, 0089_MW202_220112, 0089_MW288_220112, 0089_MW242_220112, 0089_MW249_220112, 0089_MW248_220112, 0089_MW516_220112, 0089_QC301_220112, 0089_QC401_220112	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW243_220112, 0089_MW240_220112, 0089_QC115_220112, 0089_MW238_220112, 0089_MW239_220112, 0089_MW245_220112, 0089_MW202_220112, 0089_MW288_220112, 0089_MW242_220112, 0089_MW249_220112, 0089_MW248_220112, 0089_MW516_220112, 0089_QC301_220112, 0089_QC401_220112	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW243_220112, 0089_MW240_220112, 0089_QC115_220112, 0089_MW238_220112, 0089_MW239_220112, 0089_MW245_220112, 0089_MW202_220112, 0089_MW288_220112, 0089_MW242_220112, 0089_MW249_220112, 0089_MW248_220112, 0089_MW516_220112, 0089_QC301_220112, 0089_QC401_220112	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW243_220112,	0089_MW240_220112,	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓
0089_QC115_220112,	0089_MW238_220112,							
0089_MW239_220112,	0089_MW245_220112,							
0089_MW202_220112,	0089_MW288_220112,							
0089_MW242_220112,	0089_MW249_220112,							
0089_MW248_220112,	0089_MW516_220112,							
0089_QC301_220112,	0089_QC401_220112							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW243_220112,	0089_MW240_220112,	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓
0089_QC115_220112,	0089_MW238_220112,							
0089_MW239_220112,	0089_MW245_220112,							
0089_MW202_220112,	0089_MW288_220112,							
0089_MW242_220112,	0089_MW249_220112,							
0089_MW248_220112,	0089_MW516_220112,							
0089_QC301_220112,	0089_QC401_220112							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **32320** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 3:40 pm 12/01/22	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW372	2 additional bottles included for lab internal qc	12/01/2022 10:47 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_SW373		12/01/2022 10:49 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_QC116		12/01/2022 10:50 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_PW346		12/01/2022 10:51 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: 32320 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW372	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW373	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_QC116	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW346	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **32320** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW372	HDPE (no PTFE)	20 mL	00352101061551	Grey	No	
001	0089_SW372	HDPE (no PTFE)	20 mL	00352101061588	Grey	No	
001	0089_SW372	HDPE (no PTFE)	20 mL	00350019151310	Grey	No	
001	0089_SW372	HDPE (no PTFE)	20 mL	00352101019870	Grey	No	
001	0089_SW372	Clear Plastic Bottle - Natural	250 mL	00070621200531	Green	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00352101061679	Grey	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00352101061590	Grey	No	
002	0089_SW373	Clear Plastic Bottle - Natural	250 mL	00070621200269	Green	No	
003	0089_QC116	HDPE (no PTFE)	20 mL	00352101061755	Grey	No	
003	0089_QC116	HDPE (no PTFE)	20 mL	00352101061797	Grey	No	
003	0089_QC116	Clear Plastic Bottle - Natural	250 mL	00070621200285	Green	No	
004	0089_PW346	Clear Plastic Bottle - Natural	250 mL	00070621200281	Green	No	
004	0089_PW346	HDPE (no PTFE)	20 mL	00352101061548	Grey	No	
004	0089_PW346	HDPE (no PTFE)	20 mL	00352101061680	Grey	No	

Total Bottle Count: ALS: 14, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200289**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32320	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Jan-2022 15:40	Issue Date	: 14-Jan-2022
Client Requested Due Date	: 24-Jan-2022	Scheduled Reporting Date	: **24-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 19.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200289-001	12-Jan-2022 10:47	0089_SW372_220112	✓	✓	✓	✓
EP2200289-002	12-Jan-2022 10:49	0089_SW373_220112		✓	✓	✓
EP2200289-003	12-Jan-2022 10:50	0089_QC116_220112	✓	✓		✓
EP2200289-004	12-Jan-2022 10:51	0089_PW346_220112	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200289**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 12-Jan-2022 15:40
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32320	Issue Date	: 18-Jan-2022 09:26
Sampler	: [redacted]		
Site	: DEF19009/Stirling SW/PW JS		
Quote number	: SY/139/19		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW372_220112	0089_SW373_220112	0089_QC116_220112	0089_PW346_220112	----
				Sampling date / time	12-Jan-2022 10:47	12-Jan-2022 10:49	12-Jan-2022 10:50	12-Jan-2022 10:51	----
Compound	CAS Number	LOR	Unit		EP2200289-001	EP2200289-002	EP2200289-003	EP2200289-004	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	5	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		120	117	123	307	----
Total Alkalinity as CaCO3	----	1	mg/L		120	122	124	307	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2610	2650	2880	2480	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19600	19500	19200	16900	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		515	484	----	406	----
Magnesium	7439-95-4	1	mg/L		1570	1490	----	1240	----
Sodium	7440-23-5	1	mg/L		12600	11800	----	10000	----
Potassium	7440-09-7	1	mg/L		594	562	----	490	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		610	----	604	534	----
ø Total Cations	----	0.01	meq/L		718	----	652	570	----
ø Ionic Balance	----	0.01	%		8.17	----	3.78	3.20	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	0.04	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	0.03	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.01	<0.01	0.25	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.03	0.04	0.03	1.84	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	0.05	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW372_220112	0089_SW373_220112	0089_QC116_220112	0089_PW346_220112	----
				Sampling date / time	12-Jan-2022 10:47	12-Jan-2022 10:49	12-Jan-2022 10:50	12-Jan-2022 10:51	----
Compound	CAS Number	LOR	Unit		EP2200289-001	EP2200289-002	EP2200289-003	EP2200289-004	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.02**	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW372_220112	0089_SW373_220112	0089_QC116_220112	0089_PW346_220112	----
				Sampling date / time	12-Jan-2022 10:47	12-Jan-2022 10:49	12-Jan-2022 10:50	12-Jan-2022 10:51	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2200289-001**	**EP2200289-002**	**EP2200289-003**	**EP2200289-004**	**--------**
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**----**
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**0.05**	**0.03**	**2.23**	**----**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	**0.05**	**0.03**	**2.09**	**----**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**0.05**	**0.03**	**2.20**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	**114**	**108**	**104**	**----**
13C8-PFOA	----	0.02	%		**98.2**	**98.1**	**97.9**	**98.5**	**----**

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200289**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 12-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 14-Jan-2022
C-O-C number	: 32320	Issue Date	: 18-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW JS		
Quote number	: SY/139/19		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4120588)									
EP2200288-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	299	298	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	299	298	0.3	0% - 20%
EP2200288-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	482	492	2.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	482	492	2.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4121747)									
EP2200288-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	93	93	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4121746)									
EP2200288-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	406	406	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4120393)									
EP2200288-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	106	106	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	30	30	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EP2200288-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	144	143	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	59	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	183	182	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	16	16	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4121610)									
EP2200288-006	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4121610) - continued									
EP2200288-006	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	0.09	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4121610)									
EP2200288-006	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4121610)									
EP2200288-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4121610)									
EP2200288-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4121610)									
EP2200288-006	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.09	0.10	10.5	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4120588)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	81.2	126
				<1	200 mg/L	98.1	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4121747)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.8	87.7	113
				<1	500 mg/L	100	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4121746)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	87.9	114
				<1	1000 mg/L	104	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4120393)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.4	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.1	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.3	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121610)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	78.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	83.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	82.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	84.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121610)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	83.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121610) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	91.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4121610)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	81.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	83.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4121610)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	93.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	83.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	80.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	88.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4121610)							
EP2200289-001	0089_SW372_220112	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	99.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	87.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	93.2	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	87.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	92.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	80.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121610)							
EP2200289-001	0089_SW372_220112	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	105	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	102	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	120	72.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4121610) - continued							
EP2200289-001	0089_SW372_220112	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	106	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	96.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	89.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	92.8	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	92.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	101	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	86.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4121610)							
EP2200289-001	0089_SW372_220112	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	100	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	99.1	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	92.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	100	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	84.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	95.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4121610)							
EP2200289-001	0089_SW372_220112	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	96.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	90.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	96.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	85.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200289**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 12-Jan-2022
Site	: DEF19009/Stirling SW/PW JS	Issue Date	: 18-Jan-2022
Sampler	: [redacted]	No. of samples received	: 4
Order number	: DEF19009/730	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Chloride by Discrete Analyser	1	16	6.25	10.00	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	18	5.56	10.00	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	1	13	7.69	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Chloride by Discrete Analyser	0	16	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	0	13	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW372_220112,	0089_SW373_220112,	**12-Jan-2022**	**----**	----	----	**14-Jan-2022**	26-Jan-2022	✓
0089_QC116_220112,	0089_PW346_220112							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW372_220112,	0089_SW373_220112,	**12-Jan-2022**	**----**	----	----	**17-Jan-2022**	09-Feb-2022	✓
0089_QC116_220112,	0089_PW346_220112							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW372_220112,	0089_SW373_220112,	**12-Jan-2022**	**----**	----	----	**17-Jan-2022**	09-Feb-2022	✓
0089_QC116_220112,	0089_PW346_220112							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW372_220112,	0089_SW373_220112,	**12-Jan-2022**	**----**	----	----	**14-Jan-2022**	19-Jan-2022	✓
0089_PW346_220112								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW372_220112,	0089_SW373_220112,	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓
0089_QC116_220112,	0089_PW346_220112							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW372_220112, 0089_SW373_220112, 0089_QC116_220112, 0089_PW346_220112	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW372_220112, 0089_SW373_220112, 0089_QC116_220112, 0089_PW346_220112	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW372_220112, 0089_SW373_220112, 0089_QC116_220112, 0089_PW346_220112	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW372_220112, 0089_SW373_220112, 0089_QC116_220112, 0089_PW346_220112	**12-Jan-2022**	**17-Jan-2022**	11-Jul-2022	✓	**17-Jan-2022**	11-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	13	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	0	16	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	0	13	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 32321 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 12/12/22 3:40pm	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD346		12/01/2022 10:52 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_QC117		12/01/2022 10:54 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

ALS COC#: 32321 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD346	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_QC117	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 32321 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD346	HDPE Soil Jar	200 mL	00621019083924	Grey	No	
002	0089_QC117	HDPE Soil Jar	200 mL	00621019083942	Grey	No	

Total Bottle Count: ALS: 2, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200290**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32321	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED JS		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 12-Jan-2022 15:40	Issue Date	: 13-Jan-2022
Client Requested Due Date	: 24-Jan-2022	Scheduled Reporting Date	: **24-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 19.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2200290-001	12-Jan-2022 10:52	0089_SD346_220112	✓	✓
EP2200290-002	12-Jan-2022 10:54	0089_QC117_220112	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200290**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 12-Jan-2022 15:40
Order number	: DEF19009/730	Date Analysis Commenced	: 19-Jan-2022
C-O-C number	: 32321	Issue Date	: 25-Jan-2022 16:37
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED JS		
Quote number	: SY/139/19		
No. of samples received	: 2		
No. of samples analysed	: 2		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW
[redacted]	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD346_220112	0089_QC117_220112	----	----	----
				Sampling date / time	12-Jan-2022 10:52	12-Jan-2022 10:54	----	----	----
					EP2200290-001	EP2200290-002	--------	--------	--------
					Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**32.8**	**27.9**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0003**	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0029**	**0.0070**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD346_220112	0089_QC117_220112	----	----	----
				Sampling date / time	12-Jan-2022 10:52	12-Jan-2022 10:54	----	----	----
Compound	CAS Number	LOR	Unit		EP2200290-001	EP2200290-002	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0032**	**0.0070**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0032**	**0.0070**	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0032**	**0.0070**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**114**	**112**	----	----	----
13C8-PFOA	----	0.0002	%		**98.0**	**97.0**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200290**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 12-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 19-Jan-2022
C-O-C number	: 32321	Issue Date	: 25-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED JS		
Quote number	: SY/139/19		
No. of samples received	: 2		
No. of samples analysed	: 2		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW
[redacted]	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4128499)									
ES2201448-001	Anonymous	EA055: Moisture Content	----	0.1	%	24.8	25.3	2.1	0% - 20%
ES2201516-001	Anonymous	EA055: Moisture Content	----	0.1	%	9.1	9.1	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4130688)									
EP2200290-001	0089_SD346_220112	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0029	0.0029	0.0	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2201360-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0014	0.0013	9.3	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0018	0.0014	20.3	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0125	0.0102	19.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0004	0.0003	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0120	0.0099	19.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4130688)									
EP2200290-001	0089_SD346_220112	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4130688) - continued									
EP2200290-001	0089_SD346_220112	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2201360-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0024	0.0022	9.7	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0092	0.0077	18.4	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0016	0.0013	18.7	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0008	0.0006	19.6	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0010	0.0008	31.5	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4130688)									
EP2200290-001	0089_SD346_220112	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2201360-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4130688)									
EP2200290-001	0089_SD346_220112	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2201360-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4130688)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4130688)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	86.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4130688)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.6	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4130688)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	94.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	78.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.6	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4130688) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4130688)							
EP2200290-001	0089_SD346_220112	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	86.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	77.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	76.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	77.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	113	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	88.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4130688)							
EP2200290-001	0089_SD346_220112	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	94.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	90.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	113	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	86.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	75.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	84.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	92.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	88.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	90.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	78.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	96.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4130688)							
EP2200290-001	0089_SD346_220112	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	78.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	96.0	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	97.9	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	80.8	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	111	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	84.0	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4130688) - continued							
EP2200290-001	0089_SD346_220112	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	84.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4130688)							
EP2200290-001	0089_SD346_220112	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	86.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	88.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	94.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	89.2	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200290**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 12-Jan-2022
Site	: DEF19009/Stirling SED JS	Issue Date	: 25-Jan-2022
Sampler	: [redacted]	No. of samples received	: 2
Order number	: DEF19009/730	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD346_220112,	0089_QC117_220112	**12-Jan-2022**	**----**	----	----	**19-Jan-2022**	26-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_220112,	0089_QC117_220112	**12-Jan-2022**	**21-Jan-2022**	11-Jul-2022	✓	**24-Jan-2022**	02-Mar-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_220112,	0089_QC117_220112	**12-Jan-2022**	**21-Jan-2022**	11-Jul-2022	✓	**24-Jan-2022**	02-Mar-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD346_220112,	0089_QC117_220112	**12-Jan-2022**	**21-Jan-2022**	11-Jul-2022	✓	**24-Jan-2022**	02-Mar-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_220112,	0089_QC117_220112	**12-Jan-2022**	**21-Jan-2022**	11-Jul-2022	✓	**24-Jan-2022**	02-Mar-2022	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD346_220112,	0089_QC117_220112	**12-Jan-2022**	**21-Jan-2022**	11-Jul-2022	✓	**24-Jan-2022**	02-Mar-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 32376 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW309		13/01/2022 11:42 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW306		13/01/2022 11:43 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW314		13/01/2022 11:44 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_PW315		13/01/2022 11:46 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc
005	0089_PW307		13/01/2022 11:49 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_SW310		13/01/2022 11:50 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW316		13/01/2022 11:52 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_QC119		13/01/2022 11:53 AM	Water	ALS: 3 Non ALS: 0	No	Partial 1/8		
009	0089_PW308		13/01/2022 11:56 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: **32376** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW311		13/01/2022 11:57 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: 32376 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW309	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW306	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW314	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW315	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW307	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW310	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW316	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_QC119	Surface Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
009	0089_PW308	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_SW311	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 32376 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW309	Clear Plastic Bottle - Natural	250 mL	00070621200530	Green	No	
001	0089_SW309	HDPE (no PTFE)	20 mL	00352101061699	Grey	No	
001	0089_SW309	HDPE (no PTFE)	20 mL	00352101061556	Grey	No	
002	0089_PW306	Clear Plastic Bottle - Natural	250 mL	00070621200514	Green	No	
002	0089_PW306	HDPE (no PTFE)	20 mL	00352101061651	Grey	No	
002	0089_PW306	HDPE (no PTFE)	20 mL	00352101061708	Grey	No	
003	0089_PW314	HDPE (no PTFE)	20 mL	00352101061570	Grey	No	
003	0089_PW314	HDPE (no PTFE)	20 mL	00352101061732	Grey	No	
003	0089_PW314	Clear Plastic Bottle - Natural	250 mL	00070621200555	Green	No	
004	0089_PW315	HDPE (no PTFE)	20 mL	00352101061553	Grey	No	
004	0089_PW315	HDPE (no PTFE)	20 mL	00352101061754	Grey	No	
004	0089_PW315	HDPE (no PTFE)	20 mL	00352101061835	Grey	No	
004	0089_PW315	HDPE (no PTFE)	20 mL	00352101061672	Grey	No	
004	0089_PW315	Clear Plastic Bottle - Natural	250 mL	00070621200227	Green	No	
005	0089_PW307	HDPE (no PTFE)	20 mL	00352101061833	Grey	No	
005	0089_PW307	HDPE (no PTFE)	20 mL	00352101061780	Grey	No	
005	0089_PW307	Clear Plastic Bottle - Natural	250 mL	00070621200563	Green	No	
006	0089_SW310	HDPE (no PTFE)	20 mL	00352101061616	Grey	No	
006	0089_SW310	HDPE (no PTFE)	20 mL	00352101061816	Grey	No	
006	0089_SW310	Clear Plastic Bottle - Natural	250 mL	00070621200263	Green	No	
007	0089_PW316	Clear Plastic Bottle - Natural	250 mL	00070621200279	Green	No	
007	0089_PW316	HDPE (no PTFE)	20 mL	00352101061626	Grey	No	
007	0089_PW316	HDPE (no PTFE)	20 mL	00352101061724	Grey	No	
008	0089_QC119	Clear Plastic Bottle - Natural	250 mL	00070621199634	Green	No	
008	0089_QC119	HDPE (no PTFE)	20 mL	00352101061576	Grey	No	
008	0089_QC119	HDPE (no PTFE)	20 mL	00352101061633	Grey	No	

CHAIN OF CUSTODY

COC#: **32376** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW308	Clear Plastic Bottle - Natural	250 mL	00070621200259	Green	No	
009	0089_PW308	HDPE (no PTFE)	20 mL	00352101061735	Grey	No	
009	0089_PW308	HDPE (no PTFE)	20 mL	00352101061574	Grey	No	
010	0089_SW311	Clear Plastic Bottle - Natural	250 mL	00070621199624	Green	No	
010	0089_SW311	HDPE (no PTFE)	20 mL	00352101061726	Grey	No	
010	0089_SW311	HDPE (no PTFE)	20 mL	00352101061557	Grey	No	

Total Bottle Count: ALS: 32, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200338**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32376	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Jan-2022 17:30	Issue Date	: 17-Jan-2022
Client Requested Due Date	: 27-Jan-2022	Scheduled Reporting Date	: **27-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 6.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200338-001	13-Jan-2022 11:42	0089_SW309_220113	✓	✓	✓	✓
EP2200338-002	13-Jan-2022 11:43	0089_PW306_220113	✓	✓	✓	✓
EP2200338-003	13-Jan-2022 11:44	0089_PW314_220113	✓	✓	✓	✓
EP2200338-004	13-Jan-2022 11:46	0089_PW315_220113	✓	✓	✓	✓
EP2200338-005	13-Jan-2022 11:49	0089_PW307_220113	✓	✓	✓	✓
EP2200338-006	13-Jan-2022 11:50	0089_SW310_220113	✓	✓	✓	✓
EP2200338-007	13-Jan-2022 11:52	0089_PW316_220113	✓	✓	✓	✓
EP2200338-008	13-Jan-2022 11:53	0089_QC119_220113		✓		
EP2200338-009	13-Jan-2022 11:56	0089_PW308_220113	✓	✓	✓	✓
EP2200338-010	13-Jan-2022 11:57	0089_SW311_220113	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200338**	Page	: 1 of 12
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022 17:30
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32376	Issue Date	: 24-Jan-2022 16:02
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 10		
No. of samples analysed	: 10		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW309_220113	0089_SW310_220113	0089_SW311_220113	----	----
				Sampling date / time	13-Jan-2022 11:42	13-Jan-2022 11:50	13-Jan-2022 11:57	----	----
Compound	CAS Number	LOR	Unit		EP2200338-001	EP2200338-006	EP2200338-010	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		115	120	122	----	----
Total Alkalinity as CaCO3	----	1	mg/L		115	120	122	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2570	2540	2550	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19800	20200	19800	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		433	447	441	----	----
Magnesium	7439-95-4	1	mg/L		1460	1500	1480	----	----
Sodium	7440-23-5	1	mg/L		11500	11800	11700	----	----
Potassium	7440-09-7	1	mg/L		563	579	574	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		614	625	614	----	----
ø Total Cations	----	0.01	meq/L		656	674	667	----	----
ø Ionic Balance	----	0.01	%		3.31	3.75	4.16	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW309_220113	0089_SW310_220113	0089_SW311_220113	----	----
				Sampling date / time	13-Jan-2022 11:42	13-Jan-2022 11:50	13-Jan-2022 11:57	----	----
Compound	CAS Number	LOR	Unit		EP2200338-001	EP2200338-006	EP2200338-010	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW309_220113	0089_SW310_220113	0089_SW311_220113	----	----
				Sampling date / time	13-Jan-2022 11:42	13-Jan-2022 11:50	13-Jan-2022 11:57	----	----
Compound	CAS Number	LOR	Unit		EP2200338-001	EP2200338-006	EP2200338-010	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**114**	**119**	**120**	----	----
13C8-PFOA	----	0.02	%		**90.2**	**88.4**	**91.4**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW306_220113	0089_PW314_220113	0089_PW315_220113	0089_PW307_220113	0089_PW316_220113
				Sampling date / time	13-Jan-2022 11:43	13-Jan-2022 11:44	13-Jan-2022 11:46	13-Jan-2022 11:49	13-Jan-2022 11:52
Compound	CAS Number	LOR	Unit		EP2200338-002	EP2200338-003	EP2200338-004	EP2200338-005	EP2200338-007
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		137	116	113	110	115
Total Alkalinity as CaCO3	----	1	mg/L		137	116	113	110	115
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2550	2580	2540	2540	2500
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19700	20100	19900	19900	19700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		470	444	419	447	436
Magnesium	7439-95-4	1	mg/L		1580	1500	1430	1520	1490
Sodium	7440-23-5	1	mg/L		12600	11800	11200	12000	11700
Potassium	7440-09-7	1	mg/L		614	585	550	596	578
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		612	623	616	616	610
ø Total Cations	----	0.01	meq/L		717	674	640	685	668
ø Ionic Balance	----	0.01	%		7.96	3.92	1.86	5.24	4.54
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW306_220113	0089_PW314_220113	0089_PW315_220113	0089_PW307_220113	0089_PW316_220113
				Sampling date / time	13-Jan-2022 11:43	13-Jan-2022 11:44	13-Jan-2022 11:46	13-Jan-2022 11:49	13-Jan-2022 11:52
					EP2200338-002	EP2200338-003	EP2200338-004	EP2200338-005	EP2200338-007
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW306_220113	0089_PW314_220113	0089_PW315_220113	0089_PW307_220113	0089_PW316_220113
				Sampling date / time	13-Jan-2022 11:43	13-Jan-2022 11:44	13-Jan-2022 11:46	13-Jan-2022 11:49	13-Jan-2022 11:52
					EP2200338-002	EP2200338-003	EP2200338-004	EP2200338-005	EP2200338-007
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**118**	**119**	**117**	**119**	**116**
13C8-PFOA	----	0.02	%		**87.6**	**89.7**	**92.1**	**91.6**	**92.4**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC119_220113	0089_PW308_220113	----	----	----
				Sampling date / time	13-Jan-2022 11:53	13-Jan-2022 11:56	----	----	----
Compound	CAS Number	LOR	Unit		EP2200338-008	EP2200338-009	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	113	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		----	113	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	2510	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	19900	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	443	----	----	----
Magnesium	7439-95-4	1	mg/L		----	1500	----	----	----
Sodium	7440-23-5	1	mg/L		----	11900	----	----	----
Potassium	7440-09-7	1	mg/L		----	582	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	616	----	----	----
ø Total Cations	----	0.01	meq/L		----	678	----	----	----
ø Ionic Balance	----	0.01	%		----	4.81	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_QC119_220113	0089_PW308_220113	----	----	----
				Sampling date / time	13-Jan-2022 11:53	13-Jan-2022 11:56	----	----	----
Compound	CAS Number	LOR	Unit		EP2200338-008	EP2200338-009	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**0089_QC119_220113**	**0089_PW308_220113**	**----**	**----**	**----**
			Sampling date / time	13-Jan-2022 11:53	13-Jan-2022 11:56	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EP2200338-008**	**EP2200338-009**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	**----**	**----**	**----**
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	**----**	**----**	**----**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	**----**	**----**	**----**
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	**----**	**----**	**----**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**116**	**114**	**----**	**----**	**----**
13C8-PFOA	----	0.02	%	**88.2**	**90.1**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200338**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32376	Issue Date	: 24-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 10		
No. of samples analysed	: 10		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4123951)									
EP2200338-001	0089_SW309_220113	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	115	116	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	115	116	0.0	0% - 20%
EP2200340-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	358	349	2.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	358	349	2.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4125480)									
EP2200338-001	0089_SW309_220113	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2570	2570	0.1	0% - 20%
EP2200340-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	71	73	3.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4125479)									
EP2200338-001	0089_SW309_220113	ED045G: Chloride	16887-00-6	1	mg/L	19800	19800	0.5	0% - 20%
EP2200340-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	110	112	2.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4125443)									
EP2200338-001	0089_SW309_220113	ED093F: Calcium	7440-70-2	1	mg/L	433	446	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1500	3.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11900	3.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	563	582	3.4	0% - 20%
EP2200339-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	109	108	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	22	22	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	55	55	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4129993)									
EP2200338-004	0089_PW315_220113	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4129993)									
EP2200338-004	0089_PW315_220113	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4129993)									
EP2200338-004	0089_PW315_220113	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4129993)									
EP2200338-004	0089_PW315_220113	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4129993) - continued									
EP2200338-004	0089_PW315_220113	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4129993)									
EP2200338-004	0089_PW315_220113	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4123951)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	81.2	126
				<1	200 mg/L	98.0	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4125480)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.3	87.7	113
				<1	500 mg/L	101	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4125479)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	87.9	114
				<1	1000 mg/L	104	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4125443)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	92.8	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.2	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	91.0	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.0	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129993)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	84.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	90.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	88.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	92.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129993)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	80.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	99.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129993) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129993)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	123	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	119	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	115	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	110	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	92.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129993)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	99.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	84.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	103	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	91.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4125480)							
EP2200338-001	0089_SW309_220113	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4125479)							
EP2200338-001	0089_SW309_220113	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129993)							
EP2200339-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	# Not Determined	71.0	127

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129993) - continued							
EP2200339-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	# Not Determined	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	85.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129993)							
EP2200339-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.3	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	126	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	# Not Determined	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	73.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	101	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129993)							
EP2200339-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	125	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	111	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	111	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	88.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	87.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129993)							
EP2200339-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	94.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	76.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	109	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129993) - continued							
EP2200339-005	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	101	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200338**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Site	: DEF19009/Stirling	Issue Date	: 24-Jan-2022
Sampler	: [redacted]	No. of samples received	: 10
Order number	: DEF19009/730	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200338--001	0089_SW309_220113	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200338--001	0089_SW309_220113	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	Anonymous	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	Anonymous	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	Anonymous	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2200339--005	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2200339--005	Anonymous	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2200339--005	Anonymous	**Perfluorooctanoic acid (PFOA)**	335-67-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW309_220113, 0089_PW306_220113, 0089_PW314_220113, 0089_PW315_220113, 0089_PW307_220113, 0089_SW310_220113, 0089_PW316_220113, 0089_PW308_220113, 0089_SW311_220113	**13-Jan-2022**	**----**	----	----	**17-Jan-2022**	27-Jan-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW309_220113, 0089_PW306_220113, 0089_PW314_220113, 0089_PW315_220113, 0089_PW307_220113, 0089_SW310_220113, 0089_PW316_220113, 0089_PW308_220113, 0089_SW311_220113	**13-Jan-2022**	**----**	----	----	**18-Jan-2022**	10-Feb-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW309_220113, 0089_PW306_220113, 0089_PW314_220113, 0089_PW315_220113, 0089_PW307_220113, 0089_SW310_220113, 0089_PW316_220113, 0089_PW308_220113, 0089_SW311_220113	**13-Jan-2022**	**----**	----	----	**18-Jan-2022**	10-Feb-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW309_220113, 0089_PW306_220113, 0089_PW314_220113, 0089_PW315_220113, 0089_PW307_220113, 0089_SW310_220113, 0089_PW316_220113, 0089_PW308_220113, 0089_SW311_220113	**13-Jan-2022**	**----**	----	----	**19-Jan-2022**	20-Jan-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW309_220113,	0089_PW306_220113,	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
0089_PW314_220113,	0089_PW315_220113,							
0089_PW307_220113,	0089_SW310_220113,							
0089_PW316_220113,	0089_QC119_220113,							
0089_PW308_220113,	0089_SW311_220113							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW309_220113,	0089_PW306_220113,	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
0089_PW314_220113,	0089_PW315_220113,							
0089_PW307_220113,	0089_SW310_220113,							
0089_PW316_220113,	0089_QC119_220113,							
0089_PW308_220113,	0089_SW311_220113							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_SW309_220113,	0089_PW306_220113,	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
0089_PW314_220113,	0089_PW315_220113,							
0089_PW307_220113,	0089_SW310_220113,							
0089_PW316_220113,	0089_QC119_220113,							
0089_PW308_220113,	0089_SW311_220113							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW309_220113,	0089_PW306_220113,	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
0089_PW314_220113,	0089_PW315_220113,							
0089_PW307_220113,	0089_SW310_220113,							
0089_PW316_220113,	0089_QC119_220113,							
0089_PW308_220113,	0089_SW311_220113							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_SW309_220113,	0089_PW306_220113,	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
0089_PW314_220113,	0089_PW315_220113,							
0089_PW307_220113,	0089_SW310_220113,							
0089_PW316_220113,	0089_QC119_220113,							
0089_PW308_220113,	0089_SW311_220113							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: **32366** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW217		13/01/2022 08:47 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW220		13/01/2022 08:57 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_MW224		13/01/2022 09:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_QC118		13/01/2022 09:30 AM	Water	ALS: 3 Non ALS: 0	No	Partial 1/8			
005	0089_MW282	2 extra bottles included for qc analysis	13/01/2022 09:44 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			
006	0089_QC301		13/01/2022 01:41 PM	Water	ALS: 2 Non ALS: 0	No		X		
007	0089_QC302		13/01/2022 01:42 PM	Water	ALS: 2 Non ALS: 0	No		X		
008	0089_QC401		13/01/2022 01:42 PM	Water	ALS: 2 Non ALS: 0	No		X		
009	0089_QC402		13/01/2022 01:45 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

(ALS) COC#: **32366** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW217	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW220	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW224	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_QC118	Ground Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
005	0089_MW282	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 32366 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW217	Clear Plastic Bottle - Natural	250 mL	00070621200544	Green	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00352101061583	Grey	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00352101061650	Grey	No	
002	0089_MW220	Clear Plastic Bottle - Natural	250 mL	00070621200511	Green	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00352101061637	Grey	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00352101061813	Grey	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00352101061544	Grey	No	
003	0089_MW224	Clear Plastic Bottle - Natural	250 mL	00070621200539	Green	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00352101061683	Grey	No	
004	0089_QC118	Clear Plastic Bottle - Natural	250 mL	00070621200296	Green	No	
004	0089_QC118	HDPE (no PTFE)	20 mL	00352101061764	Grey	No	
004	0089_QC118	HDPE (no PTFE)	20 mL	00352101061684	Grey	No	
005	0089_MW282	Clear Plastic Bottle - Natural	250 mL	00070621200541	Green	No	
005	0089_MW282	HDPE (no PTFE)	20 mL	00352101061773	Grey	No	
005	0089_MW282	HDPE (no PTFE)	20 mL	00352101061692	Grey	No	
005	0089_MW282	HDPE (no PTFE)	20 mL	00352101061608	Grey	No	
005	0089_MW282	HDPE (no PTFE)	20 mL	00352101061671	Grey	No	
006	0089_QC301	HDPE (no PTFE)	20 mL	00350019041237	Grey	No	
006	0089_QC301	HDPE (no PTFE)	20 mL	00350019041086	Grey	No	
007	0089_QC302	HDPE (no PTFE)	20 mL	00350019012129	Grey	No	
007	0089_QC302	HDPE (no PTFE)	20 mL	00350019011944	Grey	No	
008	0089_QC401	HDPE (no PTFE)	20 mL	00350019026851	Grey	No	
008	0089_QC401	HDPE (no PTFE)	20 mL	00350019035094	Grey	No	
009	0089_QC402	HDPE (no PTFE)	20 mL	00350019041356	Grey	No	
009	0089_QC402	HDPE (no PTFE)	20 mL	00350019041151	Grey	No	

CHAIN OF CUSTODY

COC#: **32366** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A

Random Sample Temperature on Receipt: °C

Other comments:

Total Bottle Count: ALS: 25, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200339**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32366	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 13-Jan-2022 17:30	Issue Date	: 17-Jan-2022
Client Requested Due Date	: 27-Jan-2022	Scheduled Reporting Date	: **27-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 6.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200339-001	13-Jan-2022 08:47	0089_MW217_220113	✓	✓	✓	✓
EP2200339-002	13-Jan-2022 08:57	0089_MW220_220113	✓	✓	✓	✓
EP2200339-003	13-Jan-2022 09:21	0089_MW224_220113	✓	✓	✓	✓
EP2200339-004	13-Jan-2022 09:30	0089_QC118_220113		✓		
EP2200339-005	13-Jan-2022 09:44	0089_MW282_220113	✓	✓	✓	✓
EP2200339-006	13-Jan-2022 13:41	0089_QC301_220113		✓		
EP2200339-007	13-Jan-2022 13:42	0089_QC302_220113		✓		
EP2200339-008	13-Jan-2022 13:42	0089_QC401_220113		✓		
EP2200339-009	13-Jan-2022 13:45	0089_QC402_220113		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200339**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022 17:30
Order number	: DEF19009/730	Date Analysis Commenced	: 18-Jan-2022
C-O-C number	: 32366	Issue Date	: 24-Jan-2022 16:04
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_220113	0089_MW220_220113	0089_MW224_220113	0089_QC118_220113	0089_MW282_220113
				Sampling date / time	13-Jan-2022 08:47	13-Jan-2022 08:57	13-Jan-2022 09:21	13-Jan-2022 09:30	13-Jan-2022 09:44
Compound	CAS Number	LOR	Unit		EP2200339-001	EP2200339-002	EP2200339-003	EP2200339-004	EP2200339-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**261**	**359**	**219**	----	**515**
Total Alkalinity as CaCO3	----	1	mg/L		**261**	**359**	**219**	----	**515**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**45**	**35**	**38**	----	**14**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**54**	**69**	**120**	----	**51**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**113**	**109**	**58**	----	**176**
Magnesium	7439-95-4	1	mg/L		**13**	**22**	**21**	----	**22**
Sodium	7440-23-5	1	mg/L		**51**	**55**	**88**	----	**30**
Potassium	7440-09-7	1	mg/L		**6**	**15**	**4**	----	<1
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**7.67**	**9.85**	**8.55**	----	**12.0**
ø Total Cations	----	0.01	meq/L		**9.08**	**10.0**	**8.55**	----	**11.9**
ø Ionic Balance	----	0.01	%		**8.39**	**0.89**	<0.01	----	**0.51**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.04**	**0.58**	<0.02	<0.02	**1.00**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.02**	**0.27**	<0.02	<0.02	**2.81**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	**5.45**	<0.01	<0.01	**51.5**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.69**	<0.02	<0.02	**20.7**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.04**	**72.0**	<0.01	<0.01	**91.7**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**2.2**	**0.4**	<0.1	<0.1	**0.4**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**10.8**	**0.85**	<0.02	<0.02	**0.66**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**11.7**	**1.88**	<0.02	<0.02	**4.98**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.98**	**0.28**	<0.02	<0.02	**1.10**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_220113	0089_MW220_220113	0089_MW224_220113	0089_QC118_220113	0089_MW282_220113
				Sampling date / time	13-Jan-2022 08:47	13-Jan-2022 08:57	13-Jan-2022 09:21	13-Jan-2022 09:30	13-Jan-2022 09:44
Compound	CAS Number	LOR	Unit		EP2200339-001	EP2200339-002	EP2200339-003	EP2200339-004	EP2200339-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.30**	**0.64**	<0.01	<0.01	**13.1**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.09**	<0.02	<0.02	**0.07**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**25.6**	**0.07**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.26**	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW217_220113	0089_MW220_220113	0089_MW224_220113	0089_QC118_220113	0089_MW282_220113
				Sampling date / time	13-Jan-2022 08:47	13-Jan-2022 08:57	13-Jan-2022 09:21	13-Jan-2022 09:30	13-Jan-2022 09:44
					EP2200339-001	EP2200339-002	EP2200339-003	EP2200339-004	EP2200339-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**52.0**	**83.2**	<0.01	<0.01	**188**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.05**	**77.4**	<0.01	<0.01	**143**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**51.9**	**82.2**	<0.01	<0.01	**164**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	**99.9**	**117**	**114**	**103**
13C8-PFOA	----	0.02	%		**89.0**	**90.2**	**92.5**	**89.3**	**90.3**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220113	0089_QC302_220113	0089_QC401_220113	0089_QC402_220113	----
				Sampling date / time	13-Jan-2022 13:41	13-Jan-2022 13:42	13-Jan-2022 13:42	13-Jan-2022 13:45	----
Compound	CAS Number	LOR	Unit		EP2200339-006	EP2200339-007	EP2200339-008	EP2200339-009	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220113	0089_QC302_220113	0089_QC401_220113	0089_QC402_220113	----
				Sampling date / time	13-Jan-2022 13:41	13-Jan-2022 13:42	13-Jan-2022 13:42	13-Jan-2022 13:45	----
Compound	CAS Number	LOR	Unit		EP2200339-006	EP2200339-007	EP2200339-008	EP2200339-009	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**119**	**116**	**111**	----
13C8-PFOA	----	0.02	%		**83.4**	**94.7**	**96.0**	**89.5**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200339**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 18-Jan-2022
C-O-C number	: 32366	Issue Date	: 24-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4125952)									
EP2200513-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	51	50	2.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	51	50	2.5	0% - 20%
EP2200513-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4124087)									
EP2200231-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	218	209	4.0	0% - 20%
EP2200400-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2690	2680	0.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4124088)									
EP2200231-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3640	3600	1.1	0% - 20%
EP2200400-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20400	20500	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4125443)									
EP2200338-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	433	446	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1500	3.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11900	3.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	563	582	3.4	0% - 20%
EP2200339-002	0089_MW220_220113	ED093F: Calcium	7440-70-2	1	mg/L	109	108	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	22	22	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	55	55	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4129993)									
EP2200338-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4129993)									
EP2200338-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4129993)									
EP2200338-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4129993)									
EP2200338-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4129993) - continued									
EP2200338-004	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4129993)									
EP2200338-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4125952)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	102	81.2	126
				<1	200 mg/L	99.8	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4124087)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	87.7	113
				<1	500 mg/L	101	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4124088)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	87.9	114
				<1	1000 mg/L	106	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4125443)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	92.8	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.2	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	91.0	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.0	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129993)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	84.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	90.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	88.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	92.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129993)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	80.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	99.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129993) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129993)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	123	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	119	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	115	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	110	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	92.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129993)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	99.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	84.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	103	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	91.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4124087)							
EP2200231-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	82.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4124088)							
EP2200231-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	71.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129993)							
EP2200339-005	0089_MW282_220113	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	# Not Determined	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129993) - continued							
EP2200339-005	0089_MW282_220113	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	# Not Determined	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	85.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129993)							
EP2200339-005	0089_MW282_220113	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.3	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	126	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	# Not Determined	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	73.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	101	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129993)							
EP2200339-005	0089_MW282_220113	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	125	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	111	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	111	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	88.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	87.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129993)							
EP2200339-005	0089_MW282_220113	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	94.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	76.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	109	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	101	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200339**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Site	: DEF19009/Stirling	Issue Date	: 24-Jan-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 9
Order number	: DEF19009/730	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	0089_MW282_220113	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	0089_MW282_220113	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	0089_MW282_220113	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	0089_MW282_220113	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200339--005	0089_MW282_220113	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2200339--005	0089_MW282_220113	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2200339--005	0089_MW282_220113	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2200339--005	0089_MW282_220113	**Perfluorooctanoic acid (PFOA)**	335-67-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW217_220113, 0089_MW220_220113, 0089_MW224_220113, 0089_MW282_220113	**13-Jan-2022**	**----**	----	----	**18-Jan-2022**	27-Jan-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW217_220113, 0089_MW220_220113, 0089_MW224_220113, 0089_MW282_220113	**13-Jan-2022**	**----**	----	----	**20-Jan-2022**	10-Feb-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW217_220113, 0089_MW220_220113, 0089_MW224_220113, 0089_MW282_220113	**13-Jan-2022**	**----**	----	----	**20-Jan-2022**	10-Feb-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW217_220113, 0089_MW220_220113, 0089_MW224_220113, 0089_MW282_220113	**13-Jan-2022**	**----**	----	----	**19-Jan-2022**	20-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_220113, 0089_MW220_220113, 0089_MW224_220113, 0089_QC118_220113, 0089_MW282_220113, 0089_QC301_220113, 0089_QC302_220113, 0089_QC401_220113, 0089_QC402_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_220113, 0089_MW220_220113, 0089_MW224_220113, 0089_QC118_220113, 0089_MW282_220113, 0089_QC301_220113, 0089_QC302_220113, 0089_QC401_220113, 0089_QC402_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW217_220113, 0089_MW220_220113, 0089_MW224_220113, 0089_QC118_220113, 0089_MW282_220113, 0089_QC301_220113, 0089_QC302_220113, 0089_QC401_220113, 0089_QC402_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_220113, 0089_MW220_220113, 0089_MW224_220113, 0089_QC118_220113, 0089_MW282_220113, 0089_QC301_220113, 0089_QC302_220113, 0089_QC401_220113, 0089_QC402_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW217_220113, 0089_MW220_220113, 0089_MW224_220113, 0089_QC118_220113, 0089_MW282_220113, 0089_QC301_220113, 0089_QC302_220113, 0089_QC401_220113, 0089_QC402_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: 32368 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW196		13/01/2022 09:44 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_MW289		13/01/2022 10:06 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc
003	0089_MW214		13/01/2022 10:40 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW216		13/01/2022 10:54 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_MW215		13/01/2022 11:12 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_MW225		13/01/2022 11:32 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW226		13/01/2022 01:51 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 32368 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW196	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW289	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW214	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW216	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW215	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW225	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW226	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **32368** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW196	Clear Plastic Bottle - Natural	250 mL	00070621200574	Green	No	
001	0089_MW196	HDPE (no PTFE)	20 mL	00352101061653	Grey	No	
001	0089_MW196	HDPE (no PTFE)	20 mL	00352101061753	Grey	No	
002	0089_MW289	Clear Plastic Bottle - Natural	250 mL	00070621200553	Green	No	
002	0089_MW289	HDPE (no PTFE)	20 mL	00352101061657	Grey	No	
002	0089_MW289	HDPE (no PTFE)	20 mL	00352101061621	Grey	No	
002	0089_MW289	HDPE (no PTFE)	20 mL	00352101061694	Grey	No	
002	0089_MW289	HDPE (no PTFE)	20 mL	00352101061803	Grey	No	
003	0089_MW214	Clear Plastic Bottle - Natural	250 mL	00070621200549	Green	No	
003	0089_MW214	HDPE (no PTFE)	20 mL	00352101061723	Grey	No	
003	0089_MW214	HDPE (no PTFE)	20 mL	00352101061658	Grey	No	
004	0089_MW216	Clear Plastic Bottle - Natural	250 mL	00070621200561	Green	No	
004	0089_MW216	HDPE (no PTFE)	20 mL	00352101061809	Grey	No	
004	0089_MW216	HDPE (no PTFE)	20 mL	00352101061761	Grey	No	
005	0089_MW215	Clear Plastic Bottle - Natural	250 mL	00070621200552	Green	No	
005	0089_MW215	HDPE (no PTFE)	20 mL	00352101061558	Grey	No	
005	0089_MW215	HDPE (no PTFE)	20 mL	00352101061804	Grey	No	
006	0089_MW225	Clear Plastic Bottle - Natural	250 mL	00070621200264	Green	No	
006	0089_MW225	HDPE (no PTFE)	20 mL	00352101061550	Grey	No	
006	0089_MW225	HDPE (no PTFE)	20 mL	00352101061670	Grey	No	
007	0089_MW226	Clear Plastic Bottle - Natural	250 mL	00070621200534	Green	No	
007	0089_MW226	HDPE (no PTFE)	20 mL	00352010010956	Grey	No	
007	0089_MW226	HDPE (no PTFE)	20 mL	00352010010931	Grey	No	

Total Bottle Count: ALS: 23, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200340**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32368	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Jan-2022 17:30	Issue Date	: 17-Jan-2022
Client Requested Due Date	: 27-Jan-2022	Scheduled Reporting Date	: **27-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 6.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200340-001	13-Jan-2022 09:44	0089_MW196_220113	✓	✓	✓	✓
EP2200340-002	13-Jan-2022 10:06	0089_MW289_220113	✓	✓	✓	✓
EP2200340-003	13-Jan-2022 10:40	0089_MW214_220113	✓	✓	✓	✓
EP2200340-004	13-Jan-2022 10:54	0089_MW216_220113	✓	✓	✓	✓
EP2200340-005	13-Jan-2022 11:12	0089_MW215_220113	✓	✓	✓	✓
EP2200340-006	13-Jan-2022 11:32	0089_MW225_220113	✓	✓	✓	✓
EP2200340-007	13-Jan-2022 13:51	0089_MW226_220113	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200340**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022 17:30
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32368	Issue Date	: 24-Jan-2022 16:04
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW196_220113	0089_MW289_220113	0089_MW214_220113	0089_MW216_220113	0089_MW215_220113
				Sampling date / time	13-Jan-2022 09:44	13-Jan-2022 10:06	13-Jan-2022 10:40	13-Jan-2022 10:54	13-Jan-2022 11:12
Compound	CAS Number	LOR	Unit		EP2200340-001	EP2200340-002	EP2200340-003	EP2200340-004	EP2200340-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		207	358	375	324	290
Total Alkalinity as CaCO3	----	1	mg/L		207	358	375	324	290
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		18	71	32	82	86
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		32	110	981	446	325
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		58	136	197	148	123
Magnesium	7439-95-4	1	mg/L		17	33	67	49	34
Sodium	7440-23-5	1	mg/L		21	81	436	184	145
Potassium	7440-09-7	1	mg/L		2	9	10	5	8
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		5.41	11.7	35.8	20.8	16.8
ø Total Cations	----	0.01	meq/L		5.26	13.2	34.6	19.5	15.4
ø Ionic Balance	----	0.01	%		1.46	6.09	1.80	3.01	4.05
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.12	<0.02	0.62	0.04
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.09	<0.02	0.56	0.06
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.88	<0.01	4.98	0.47
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.03	<0.02	0.18	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.59	<0.01	1.20	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	1.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.04	<0.02	4.08	0.04
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.17	<0.02	3.08	0.13
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	0.03	<0.02	0.48	<0.02

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW196_220113	0089_MW289_220113	0089_MW214_220113	0089_MW216_220113	0089_MW215_220113
				Sampling date / time	13-Jan-2022 09:44	13-Jan-2022 10:06	13-Jan-2022 10:40	13-Jan-2022 10:54	13-Jan-2022 11:12
					EP2200340-001	EP2200340-002	EP2200340-003	EP2200340-004	EP2200340-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.05**	<0.01	**0.34**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	**2.23**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW196_220113	0089_MW289_220113	0089_MW214_220113	0089_MW216_220113	0089_MW215_220113
				Sampling date / time	13-Jan-2022 09:44	13-Jan-2022 10:06	13-Jan-2022 10:40	13-Jan-2022 10:54	13-Jan-2022 11:12
					EP2200340-001	EP2200340-002	EP2200340-003	EP2200340-004	EP2200340-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**2.00**	<0.01	**18.8**	**0.74**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**1.47**	<0.01	**6.18**	**0.47**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**1.88**	<0.01	**18.1**	**0.68**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**104**	**117**	**115**	**119**
13C8-PFOA	----	0.02	%		**87.4**	**88.9**	**91.6**	**86.3**	**92.6**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW225_220113	0089_MW226_220113	----	----	----
				Sampling date / time	13-Jan-2022 11:32	13-Jan-2022 13:51	----	----	----
Compound	CAS Number	LOR	Unit		EP2200340-006	EP2200340-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		399	664	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		399	664	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		53	1940	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		620	14900	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		146	411	----	----	----
Magnesium	7439-95-4	1	mg/L		54	1170	----	----	----
Sodium	7440-23-5	1	mg/L		279	8660	----	----	----
Potassium	7440-09-7	1	mg/L		7	465	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		26.6	474	----	----	----
ø Total Cations	----	0.01	meq/L		24.0	505	----	----	----
ø Ionic Balance	----	0.01	%		4.98	3.21	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW225_220113	0089_MW226_220113	----	----	----
				Sampling date / time	13-Jan-2022 11:32	13-Jan-2022 13:51	----	----	----
Compound	CAS Number	LOR	Unit		EP2200340-006	EP2200340-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW225_220113	0089_MW226_220113	----	----	----
				Sampling date / time	13-Jan-2022 11:32	13-Jan-2022 13:51	----	----	----
Compound	CAS Number	LOR	Unit		EP2200340-006	EP2200340-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**119**	**119**	----	----	----
13C8-PFOA	----	0.02	%		**89.2**	**85.8**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200340**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32368	Issue Date	: 24-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4123951)									
EP2200338-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	115	116	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	115	116	0.0	0% - 20%
EP2200340-002	0089_MW289_220113	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	358	349	2.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	358	349	2.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4125480)									
EP2200338-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2570	2570	0.1	0% - 20%
EP2200340-002	0089_MW289_220113	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	71	73	3.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4125479)									
EP2200338-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19800	19800	0.5	0% - 20%
EP2200340-002	0089_MW289_220113	ED045G: Chloride	16887-00-6	1	mg/L	110	112	2.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4125443)									
EP2200338-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	433	446	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1500	3.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11900	3.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	563	582	3.4	0% - 20%
EP2200339-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	109	108	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	22	22	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	55	55	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4129996)									
EP2200343-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	<0.01	155	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2200343-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4129996)									
EP2200343-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2200343-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4129996)									
EP2200343-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4129996) - continued									
EP2200343-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2200343-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4129996)									
EP2200343-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2200343-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4129996)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4129996) - continued									
EP2200343-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.08	<0.01	156	No Limit
EP2200343-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4123951)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	81.2	126
				<1	200 mg/L	98.0	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4125480)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.3	87.7	113
				<1	500 mg/L	101	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4125479)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	87.9	114
				<1	1000 mg/L	104	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4125443)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	92.8	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.2	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	91.0	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.0	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129996)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	85.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	122	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	92.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	90.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	84.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129996)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	81.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	98.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129996) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	109	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129996)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	118	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	118	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	113	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129996)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	82.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	106	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	93.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4125480)							
EP2200338-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4125479)							
EP2200338-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129996)							
EP2200340-002	0089_MW289_220113	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	88.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	78.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129996) - continued							
EP2200340-002	0089_MW289_220113	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	82.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	110	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	85.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129996)							
EP2200340-002	0089_MW289_220113	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	90.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	78.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	78.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.0	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	85.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129996)							
EP2200340-002	0089_MW289_220113	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	105	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	103	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	107	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	104	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129996)							
EP2200340-002	0089_MW289_220113	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	95.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	83.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	107	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	95.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200340**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Site	: DEF19009/Stirling	Issue Date	: 24-Jan-2022
Sampler	: [redacted]	No. of samples received	: 7
Order number	: DEF19009/730	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200338--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200338--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200340--002	0089_MW289_220113	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW196_220113, 0089_MW289_220113, 0089_MW214_220113, 0089_MW216_220113, 0089_MW215_220113, 0089_MW225_220113, 0089_MW226_220113	**13-Jan-2022**	**----**	----	----	**17-Jan-2022**	27-Jan-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW196_220113, 0089_MW289_220113, 0089_MW214_220113, 0089_MW216_220113, 0089_MW215_220113, 0089_MW225_220113, 0089_MW226_220113	**13-Jan-2022**	**----**	----	----	**18-Jan-2022**	10-Feb-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW196_220113, 0089_MW289_220113, 0089_MW214_220113, 0089_MW216_220113, 0089_MW215_220113, 0089_MW225_220113, 0089_MW226_220113	**13-Jan-2022**	**----**	----	----	**18-Jan-2022**	10-Feb-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW196_220113, 0089_MW289_220113, 0089_MW214_220113, 0089_MW216_220113, 0089_MW215_220113, 0089_MW225_220113, 0089_MW226_220113	**13-Jan-2022**	**----**	----	----	**19-Jan-2022**	20-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW196_220113, 0089_MW289_220113, 0089_MW214_220113, 0089_MW216_220113, 0089_MW215_220113, 0089_MW225_220113, 0089_MW226_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW196_220113, 0089_MW289_220113, 0089_MW214_220113, 0089_MW216_220113, 0089_MW215_220113, 0089_MW225_220113, 0089_MW226_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW196_220113, 0089_MW289_220113, 0089_MW214_220113, 0089_MW216_220113, 0089_MW215_220113, 0089_MW225_220113, 0089_MW226_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW196_220113, 0089_MW289_220113, 0089_MW214_220113, 0089_MW216_220113, 0089_MW215_220113, 0089_MW225_220113, 0089_MW226_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW196_220113, 0089_MW289_220113, 0089_MW214_220113, 0089_MW216_220113, 0089_MW215_220113, 0089_MW225_220113, 0089_MW226_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: 32373 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD374		13/01/2022 10:29 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_SD375		13/01/2022 10:30 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD378		13/01/2022 10:30 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD308		13/01/2022 12:10 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
005	0089_SD316		13/01/2022 12:17 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
006	0089_SD307		13/01/2022 12:20 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
007	0089_SD315		13/01/2022 12:28 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
008	0089_SD314		13/01/2022 12:37 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
009	0089_SD306		13/01/2022 12:52 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

(ALS) COC#: 32373 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD374	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_SD375	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD378	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD308	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0089_SD316	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0089_SD307	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
007	0089_SD315	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
008	0089_SD314	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
009	0089_SD306	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 32373 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD374	HDPE Soil Jar	200 mL	00621019083943	Grey	No	
002	0089_SD375	HDPE Soil Jar	200 mL	00621019083863	Grey	No	
003	0089_SD378	HDPE Soil Jar	200 mL	00621019083902	Grey	No	
004	0089_SD308	HDPE Soil Jar	200 mL	00621019083918	Grey	No	
005	0089_SD316	HDPE Soil Jar	200 mL	00621019083892	Grey	No	
006	0089_SD307	HDPE Soil Jar	200 mL	00621019083859	Grey	No	
007	0089_SD315	HDPE Soil Jar	200 mL	00621019083860	Grey	No	
008	0089_SD314	HDPE Soil Jar	200 mL	00621019083960	Grey	No	
009	0089_SD306	HDPE Soil Jar	200 mL	00621019083880	Grey	No	

Total Bottle Count: ALS: 9, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200341**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32373	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 13-Jan-2022 17:30	Issue Date	: 17-Jan-2022
Client Requested Due Date	: 27-Jan-2022	Scheduled Reporting Date	: **27-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 6.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2200341-001	13-Jan-2022 10:29	0089_SD374_220113	✓	✓
EP2200341-002	13-Jan-2022 10:30	0089_SD375_220113	✓	✓
EP2200341-003	13-Jan-2022 10:30	0089_SD378_220113	✓	✓
EP2200341-004	13-Jan-2022 12:10	0089_SD308_220113	✓	✓
EP2200341-005	13-Jan-2022 12:17	0089_SD316_220113	✓	✓
EP2200341-006	13-Jan-2022 12:20	0089_SD307_220113	✓	✓
EP2200341-007	13-Jan-2022 12:28	0089_SD315_220113	✓	✓
EP2200341-008	13-Jan-2022 12:37	0089_SD314_220113	✓	✓
EP2200341-009	13-Jan-2022 12:52	0089_SD306_220113	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200341**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022 17:30
Order number	: DEF19009/730	Date Analysis Commenced	: 20-Jan-2022
C-O-C number	: 32373	Issue Date	: 27-Jan-2022 12:22
Sampler	: [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD374_220113	0089_SD375_220113	0089_SD378_220113	0089_SD308_220113	0089_SD316_220113
				Sampling date / time	13-Jan-2022 10:29	13-Jan-2022 10:30	13-Jan-2022 10:30	13-Jan-2022 12:10	13-Jan-2022 12:17
					EP2200341-001	EP2200341-002	EP2200341-003	EP2200341-004	EP2200341-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**15.6**	**20.7**	**18.3**	**11.0**	**16.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD374_220113	0089_SD375_220113	0089_SD378_220113	0089_SD308_220113	0089_SD316_220113
				Sampling date / time	13-Jan-2022 10:29	13-Jan-2022 10:30	13-Jan-2022 10:30	13-Jan-2022 12:10	13-Jan-2022 12:17
Compound	CAS Number	LOR	Unit		EP2200341-001	EP2200341-002	EP2200341-003	EP2200341-004	EP2200341-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**118**	**116**	**116**	**119**	**114**
13C8-PFOA	----	0.0002	%		**108**	**100**	**105**	**106**	**113**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD307_220113	0089_SD315_220113	0089_SD314_220113	0089_SD306_220113	----
			Sampling date / time	13-Jan-2022 12:20	13-Jan-2022 12:28	13-Jan-2022 12:37	13-Jan-2022 12:52	----
Compound	CAS Number	LOR	Unit	EP2200341-006	EP2200341-007	EP2200341-008	EP2200341-009	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**25.9**	**31.0**	**23.6**	**28.6**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD307_220113	0089_SD315_220113	0089_SD314_220113	0089_SD306_220113	----
				Sampling date / time	13-Jan-2022 12:20	13-Jan-2022 12:28	13-Jan-2022 12:37	13-Jan-2022 12:52	----
Compound	CAS Number	LOR	Unit		EP2200341-006	EP2200341-007	EP2200341-008	EP2200341-009	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**112**	**116**	**108**	**110**	----
13C8-PFOA	----	0.0002	%		**106**	**106**	**103**	**102**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200341**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 20-Jan-2022
C-O-C number	: 32373	Issue Date	: 27-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4130058)									
EP2200341-003	0089_SD378_220113	EA055: Moisture Content	----	0.1	%	18.3	17.9	2.6	0% - 20%
EP2200401-005	Anonymous	EA055: Moisture Content	----	0.1	%	25.2	25.2	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4133732)									
EP2200341-001	0089_SD374_220113	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2200531-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0035	0.0033	6.9	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0263	0.0313	17.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4133732)									
EP2200341-001	0089_SD374_220113	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4133732) - continued									
EP2200341-001	0089_SD374_220113	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2200531-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4133732)									
EP2200341-001	0089_SD374_220113	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200531-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4133732)									
EP2200341-001	0089_SD374_220113	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2200531-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4133732)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4133732)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	84.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4133732)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.6	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.5	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4133732)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	77.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	89.2	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4133732) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	84.0	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4133732)							
EP2200341-001	0089_SD374_220113	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	86.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	82.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	89.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	91.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	82.4	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	94.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4133732)							
EP2200341-001	0089_SD374_220113	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.4	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	98.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	117	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	89.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	82.0	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	94.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	96.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	91.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	109	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	91.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	108	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4133732)							
EP2200341-001	0089_SD374_220113	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	97.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	111	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	95.8	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	102	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	86.0	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4133732) - continued							
EP2200341-001	0089_SD374_220113	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	91.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4133732)							
EP2200341-001	0089_SD374_220113	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	87.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	84.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	106	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	111	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200341**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Site	: DEF19009/Stirling	Issue Date	: 27-Jan-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 9
Order number	: DEF19009/730	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD374_220113, 0089_SD375_220113, 0089_SD378_220113, 0089_SD308_220113, 0089_SD316_220113, 0089_SD307_220113, 0089_SD315_220113, 0089_SD314_220113, 0089_SD306_220113	**13-Jan-2022**	**----**	----	----	**20-Jan-2022**	27-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD374_220113, 0089_SD375_220113, 0089_SD378_220113, 0089_SD308_220113, 0089_SD316_220113, 0089_SD307_220113, 0089_SD315_220113, 0089_SD314_220113, 0089_SD306_220113	**13-Jan-2022**	**24-Jan-2022**	12-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD374_220113, 0089_SD375_220113, 0089_SD378_220113, 0089_SD308_220113, 0089_SD316_220113, 0089_SD307_220113, 0089_SD315_220113, 0089_SD314_220113, 0089_SD306_220113	**13-Jan-2022**	**24-Jan-2022**	12-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD374_220113, 0089_SD375_220113, 0089_SD378_220113, 0089_SD308_220113, 0089_SD316_220113, 0089_SD307_220113, 0089_SD315_220113, 0089_SD314_220113, 0089_SD306_220113	**13-Jan-2022**	**24-Jan-2022**	12-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD374_220113, 0089_SD375_220113, 0089_SD378_220113, 0089_SD308_220113, 0089_SD316_220113, 0089_SD307_220113, 0089_SD315_220113, 0089_SD314_220113, 0089_SD306_220113	**13-Jan-2022**	**24-Jan-2022**	12-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD374_220113, 0089_SD375_220113, 0089_SD378_220113, 0089_SD308_220113, 0089_SD316_220113, 0089_SD307_220113, 0089_SD315_220113, 0089_SD314_220113, 0089_SD306_220113	**13-Jan-2022**	**24-Jan-2022**	12-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: 32374 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW374		13/01/2022 10:33 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_SW314		13/01/2022 10:34 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
003	0089_PW378		13/01/2022 10:36 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_PW375		13/01/2022 10:36 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_SW318		13/01/2022 01:37 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_SW317		13/01/2022 01:38 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: **32374** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW374	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW314	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW378	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW375	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW318	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW317	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 32374 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW374	HDPE (no PTFE)	20 mL	00352101061792	Grey	No	
001	0089_PW374	HDPE (no PTFE)	20 mL	00352101061586	Grey	No	
001	0089_PW374	HDPE (no PTFE)	20 mL	00350019177666	Grey	No	
001	0089_PW374	Clear Plastic Bottle - Natural	250 mL	00070621200220	Green	No	
001	0089_PW374	HDPE (no PTFE)	20 mL	00352010011034	Grey	No	
002	0089_SW314	HDPE (no PTFE)	20 mL	00352101061706	Grey	No	
002	0089_SW314	HDPE (no PTFE)	20 mL	00352101061649	Grey	No	
002	0089_SW314	HDPE (no PTFE)	20 mL	00352010010856	Grey	No	
002	0089_SW314	HDPE (no PTFE)	20 mL	00352010010975	Grey	No	
002	0089_SW314	Clear Plastic Bottle - Natural	250 mL	00070621200558	Green	No	
003	0089_PW378	Clear Plastic Bottle - Natural	250 mL	00070621200538	Green	No	
003	0089_PW378	HDPE (no PTFE)	20 mL	00352101061808	Grey	No	
003	0089_PW378	HDPE (no PTFE)	20 mL	00352101061791	Grey	No	
004	0089_PW375	Clear Plastic Bottle - Natural	250 mL	00070621200254	Green	No	
004	0089_PW375	HDPE (no PTFE)	20 mL	00352101061600	Grey	No	
004	0089_PW375	HDPE (no PTFE)	20 mL	00352101061552	Grey	No	
005	0089_SW318	HDPE (no PTFE)	20 mL	00352101061568	Grey	No	
005	0089_SW318	HDPE (no PTFE)	20 mL	00352101061663	Grey	No	
005	0089_SW318	Clear Plastic Bottle - Natural	250 mL	00070621200533	Green	No	
006	0089_SW317	Clear Plastic Bottle - Natural	250 mL	00070621200550	Green	No	
006	0089_SW317	HDPE (no PTFE)	20 mL	00352101061664	Grey	No	
006	0089_SW317	HDPE (no PTFE)	20 mL	00352101061713	Grey	No	

Total Bottle Count: ALS: 22, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200343**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32374	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Jan-2022 17:30	Issue Date	: 17-Jan-2022
Client Requested Due Date	: 27-Jan-2022	Scheduled Reporting Date	: **27-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 6.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200343-001	13-Jan-2022 10:33	0089_PW374_220113	✓	✓	✓	✓
EP2200343-002	13-Jan-2022 10:34	0089_SW314_220113	✓	✓	✓	✓
EP2200343-003	13-Jan-2022 10:36	0089_PW378_220113	✓	✓	✓	✓
EP2200343-004	13-Jan-2022 10:36	0089_PW375_220113	✓	✓	✓	✓
EP2200343-005	13-Jan-2022 13:37	0089_SW318_220113	✓	✓	✓	✓
EP2200343-006	13-Jan-2022 13:38	0089_SW317_220113	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200343**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022 17:30
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32374	Issue Date	: 25-Jan-2022 16:58
Sampler	: [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW378_220113	0089_PW375_220113	----	----	----
				Sampling date / time	13-Jan-2022 10:36	13-Jan-2022 10:36	----	----	----
Compound	CAS Number	LOR	Unit		EP2200343-003	EP2200343-004	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**123**	**137**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**123**	**137**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2570**	**2090**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19800**	**18700**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**481**	**428**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1590**	**1410**	----	----	----
Sodium	7440-23-5	1	mg/L		**12600**	**11200**	----	----	----
Potassium	7440-09-7	1	mg/L		**612**	**536**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**614**	**574**	----	----	----
ø Total Cations	----	0.01	meq/L		**718**	**638**	----	----	----
ø Ionic Balance	----	0.01	%		**7.81**	**5.32**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW378_220113	0089_PW375_220113	----	----	----
				Sampling date / time	13-Jan-2022 10:36	13-Jan-2022 10:36	----	----	----
Compound	CAS Number	LOR	Unit		EP2200343-003	EP2200343-004	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW378_220113	0089_PW375_220113	----	----	----
				Sampling date / time	13-Jan-2022 10:36	13-Jan-2022 10:36	----	----	----
Compound	CAS Number	LOR	Unit		EP2200343-003	EP2200343-004	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**115**	**117**	----	----	----
13C8-PFOA	----	0.02	%		**91.0**	**91.0**	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW374_220113	0089_SW314_220113	0089_SW318_220113	0089_SW317_220113	----
				Sampling date / time	13-Jan-2022 10:33	13-Jan-2022 10:34	13-Jan-2022 13:37	13-Jan-2022 13:38	----
Compound	CAS Number	LOR	Unit		EP2200343-001	EP2200343-002	EP2200343-005	EP2200343-006	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		129	122	125	122	----
Total Alkalinity as CaCO3	----	1	mg/L		129	122	125	122	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2560	2550	2400	2060	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19700	20000	19800	19900	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		455	452	445	466	----
Magnesium	7439-95-4	1	mg/L		1530	1500	1480	1570	----
Sodium	7440-23-5	1	mg/L		12000	11700	11800	12500	----
Potassium	7440-09-7	1	mg/L		593	559	569	608	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		612	620	611	607	----
ø Total Cations	----	0.01	meq/L		686	669	672	712	----
ø Ionic Balance	----	0.01	%		5.72	3.84	4.74	7.97	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.08	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW374_220113	0089_SW314_220113	0089_SW318_220113	0089_SW317_220113	----
				Sampling date / time	13-Jan-2022 10:33	13-Jan-2022 10:34	13-Jan-2022 13:37	13-Jan-2022 13:38	----
Compound	CAS Number	LOR	Unit		EP2200343-001	EP2200343-002	EP2200343-005	EP2200343-006	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW374_220113	0089_SW314_220113	0089_SW318_220113	0089_SW317_220113	----
				Sampling date / time	13-Jan-2022 10:33	13-Jan-2022 10:34	13-Jan-2022 13:37	13-Jan-2022 13:38	----
Compound	CAS Number	LOR	Unit		EP2200343-001	EP2200343-002	EP2200343-005	EP2200343-006	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.08**	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.08**	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.08**	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**118**	**116**	**120**	**118**	----
13C8-PFOA	----	0.02	%		**89.4**	**87.6**	**88.8**	**89.8**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200343**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32374	Issue Date	: 25-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4123951)									
EP2200338-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	115	116	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	115	116	0.0	0% - 20%
EP2200340-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	358	349	2.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	358	349	2.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4123952)									
EP2200343-005	0089_SW318_220113	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	124	0.0	0% - 20%
EP2200400-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	121	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	121	120	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4126017)									
EP2200343-001	0089_PW374_220113	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2560	2600	1.6	0% - 20%
EP2200499-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4126016)									
EP2200343-001	0089_PW374_220113	ED045G: Chloride	16887-00-6	1	mg/L	19700	19800	0.9	0% - 20%
EP2200499-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1	1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4125444)									
EP2200343-001	0089_PW374_220113	ED093F: Calcium	7440-70-2	1	mg/L	455	473	3.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1530	1590	4.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	12600	5.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	593	617	4.0	0% - 20%
EP2200427-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	22	23	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	9	9	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4129996)									
EP2200343-001	0089_PW374_220113	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	<0.01	155	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2200343-002	0089_SW314_220113	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4129996)									
EP2200343-001	0089_PW374_220113	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2200343-002	0089_SW314_220113	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4129996) - continued									
EP2200343-002	0089_SW314_220113	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4129996)									
EP2200343-001	0089_PW374_220113	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2200343-002	0089_SW314_220113	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4129996)									
EP2200343-001	0089_PW374_220113	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4129996) - continued									
EP2200343-002	0089_SW314_220113	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4129996)									
EP2200343-001	0089_PW374_220113	EP231X: Sum of PFAS	----	0.01	µg/L	0.08	<0.01	156	No Limit
EP2200343-002	0089_SW314_220113	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4123951)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	81.2	126
				<1	200 mg/L	98.0	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4123952)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	106	81.2	126
				<1	200 mg/L	99.4	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4126017)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	87.7	113
				<1	500 mg/L	104	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4126016)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	87.9	114
				<1	1000 mg/L	108	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4125444)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	92.5	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.8	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	90.8	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	89.7	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129996)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	85.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	122	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	92.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	90.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	84.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129996)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129996) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	81.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	98.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	109	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129996)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	118	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	118	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	113	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129996)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	82.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	106	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	93.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4126017)							
EP2200343-001	0089_PW374_220113	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4126016)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 4126016) - continued							
EP2200343-001	0089_PW374_220113	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129996)							
EP2200340-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	88.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	78.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	82.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	110	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	85.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129996)							
EP2200340-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	90.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	78.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	78.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.0	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	85.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129996)							
EP2200340-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	105	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	103	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	107	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	104	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129996)							
EP2200340-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	95.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	83.2	64.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129996) - continued							
EP2200340-002	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	107	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	95.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200343**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 13-Jan-2022
Site	: DEF19009/Stirling	Issue Date	: 25-Jan-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: DEF19009/730	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2200343--001	0089_PW374_220113	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2200343--001	0089_PW374_220113	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2200340--002	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW374_220113,	0089_SW314_220113,	**13-Jan-2022**	**----**	----	----	**17-Jan-2022**	27-Jan-2022	✓
0089_PW378_220113,	0089_PW375_220113,							
0089_SW318_220113,	0089_SW317_220113							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW374_220113,	0089_SW314_220113,	**13-Jan-2022**	**----**	----	----	**25-Jan-2022**	10-Feb-2022	✓
0089_PW378_220113,	0089_PW375_220113,							
0089_SW318_220113,	0089_SW317_220113							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_PW374_220113,	0089_SW314_220113,	**13-Jan-2022**	**----**	----	----	**25-Jan-2022**	10-Feb-2022	✓
0089_PW378_220113,	0089_PW375_220113,							
0089_SW318_220113,	0089_SW317_220113							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW374_220113, 0089_SW314_220113, 0089_PW378_220113, 0089_PW375_220113, 0089_SW318_220113, 0089_SW317_220113	**13-Jan-2022**	**----**	----	----	**19-Jan-2022**	20-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW374_220113, 0089_SW314_220113, 0089_PW378_220113, 0089_PW375_220113, 0089_SW318_220113, 0089_SW317_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW374_220113, 0089_SW314_220113, 0089_PW378_220113, 0089_PW375_220113, 0089_SW318_220113, 0089_SW317_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW374_220113, 0089_SW314_220113, 0089_PW378_220113, 0089_PW375_220113, 0089_SW318_220113, 0089_SW317_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW374_220113, 0089_SW314_220113, 0089_PW378_220113, 0089_PW375_220113, 0089_SW318_220113, 0089_SW317_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW374_220113, 0089_SW314_220113, 0089_PW378_220113, 0089_PW375_220113, 0089_SW318_220113, 0089_SW317_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 32402 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 14/01 @ 1620.	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW228		14/01/2022 09:19 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW227		14/01/2022 09:57 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_QC301		14/01/2022 12:14 PM	Water	ALS: 2 Non ALS: 0	No		X		
004	0089_QC401		14/01/2022 12:15 PM	Water	ALS: 2 Non ALS: 0	No		X		

Environmental Division Perth

Work Order Reference

EP2200399

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

ALS COC#: 32402 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW228	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW227	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: **32402** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW228	Clear Plastic Bottle - Natural	250 mL	00070621200284	Green	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00352101061832	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00352101061814	Grey	No	
002	0089_MW227	HDPE (no PTFE)	20 mL	00352010010864	Grey	No	
002	0089_MW227	HDPE (no PTFE)	20 mL	00350019177746	Grey	No	
002	0089_MW227	Clear Plastic Bottle - Natural	250 mL	00070621200312	Green	No	
003	0089_QC301	HDPE (no PTFE)	20 mL	00352010040446	Grey	No	
003	0089_QC301	HDPE (no PTFE)	20 mL	00352010040418	Grey	No	
004	0089_QC401	HDPE (no PTFE)	20 mL	00352010040490	Grey	No	
004	0089_QC401	HDPE (no PTFE)	20 mL	00352010040262	Grey	No	

Total Bottle Count: ALS: 10, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200399**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32402	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Jan-2022 16:20	Issue Date	: 17-Jan-2022
Client Requested Due Date	: 25-Jan-2022	Scheduled Reporting Date	: **25-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 10.5
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200399-001	14-Jan-2022 09:19	0089_MW228_220114	✓	✓	✓	✓
EP2200399-002	14-Jan-2022 09:57	0089_MW227_220114	✓	✓	✓	✓
EP2200399-003	14-Jan-2022 12:14	0089_QC301_220114		✓		
EP2200399-004	14-Jan-2022 12:15	0089_QC401_220114		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200399**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Jan-2022 16:20
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32402	Issue Date	: 21-Jan-2022 10:29
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_220114	0089_MW227_220114	----	----	----
				Sampling date / time	14-Jan-2022 09:19	14-Jan-2022 09:57	----	----	----
Compound	CAS Number	LOR	Unit		EP2200399-001	EP2200399-002	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**549**	**357**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**549**	**357**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**961**	**217**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**6270**	**834**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**196**	**116**	----	----	----
Magnesium	7439-95-4	1	mg/L		**468**	**71**	----	----	----
Sodium	7440-23-5	1	mg/L		**3730**	**470**	----	----	----
Potassium	7440-09-7	1	mg/L		**178**	**25**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**208**	**35.2**	----	----	----
ø Total Cations	----	0.01	meq/L		**215**	**32.7**	----	----	----
ø Ionic Balance	----	0.01	%		**1.71**	**3.63**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.21**	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.11**	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.10**	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**2.0**	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**8.90**	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**12.0**	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**2.42**	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_220114	0089_MW227_220114	----	----	----
				Sampling date / time	14-Jan-2022 09:19	14-Jan-2022 09:57	----	----	----
Compound	CAS Number	LOR	Unit		EP2200399-001	EP2200399-002	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.03**	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.27**	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_220114	0089_MW227_220114	----	----	----
				Sampling date / time	14-Jan-2022 09:19	14-Jan-2022 09:57	----	----	----
Compound	CAS Number	LOR	Unit		EP2200399-001	EP2200399-002	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**26.0**	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.10**	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**25.9**	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**119**	**119**	----	----	----
13C8-PFOA	----	0.02	%		**89.0**	**96.0**	----	----	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	0089_QC301_220114	0089_QC401_220114	----	----	----
				Sampling date / time	14-Jan-2022 12:14	14-Jan-2022 12:15	----	----	----
Compound	CAS Number	LOR	Unit		EP2200399-003	EP2200399-004	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220114	0089_QC401_220114	----	----	----
				Sampling date / time	14-Jan-2022 12:14	14-Jan-2022 12:15	----	----	----
Compound	CAS Number	LOR	Unit		EP2200399-003	EP2200399-004	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**120**	----	----	----
13C8-PFOA	----	0.02	%		**92.6**	**96.4**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200399**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32402	Issue Date	: 21-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4123950)									
EP2200310-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	211	211	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	211	211	0.0	0% - 20%
EP2200423-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	266	267	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	266	267	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4124087)									
EP2200231-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	218	209	4.0	0% - 20%
EP2200400-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2690	2680	0.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4124088)									
EP2200231-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3640	3600	1.1	0% - 20%
EP2200400-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	20400	20500	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4125444)									
EP2200343-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	455	473	3.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1530	1590	4.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	12600	5.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	593	617	4.0	0% - 20%
EP2200427-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	22	23	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	9	9	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4123950)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	81.2	126
				<1	200 mg/L	99.4	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4124087)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	87.7	113
				<1	500 mg/L	101	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4124088)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	87.9	114
				<1	1000 mg/L	106	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4125444)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	92.5	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.8	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	90.8	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	89.7	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4128332)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	87.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	86.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	87.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	98.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4128332)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	103	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4128332) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	116	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	105	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4128332)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	85.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	113	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	110	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	96.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	95.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	82.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4128332)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	99.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	84.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	100	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	73.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4124087)							
EP2200231-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	82.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4124088)							
EP2200231-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	71.6	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200399**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Jan-2022
Site	: DEF19009/Stirling GW - AG	Issue Date	: 21-Jan-2022
Sampler	: [redacted]	No. of samples received	: 4
Order number	: DEF19009/730	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	4	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	4	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW228_220114,	0089_MW227_220114	**14-Jan-2022**	**----**	----	----	**17-Jan-2022**	28-Jan-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW228_220114,	0089_MW227_220114	**14-Jan-2022**	**----**	----	----	**20-Jan-2022**	11-Feb-2022	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW228_220114,	0089_MW227_220114	**14-Jan-2022**	**----**	----	----	**20-Jan-2022**	11-Feb-2022	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW228_220114,	0089_MW227_220114	**14-Jan-2022**	**----**	----	----	**19-Jan-2022**	21-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW228_220114, 0089_QC301_220114,	0089_MW227_220114, 0089_QC401_220114	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW228_220114, 0089_QC301_220114,	0089_MW227_220114, 0089_QC401_220114	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW228_220114, 0089_MW227_220114, 0089_QC301_220114, 0089_QC401_220114	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW228_220114, 0089_MW227_220114, 0089_QC301_220114, 0089_QC401_220114	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW228_220114, 0089_MW227_220114, 0089_QC301_220114, 0089_QC401_220114	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	4	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	4	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 32403 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 14/01 @ 1620.	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW406		14/01/2022 09:28 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW405		14/01/2022 09:32 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW407		14/01/2022 09:45 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW408		14/01/2022 10:06 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc
005	0089_PW409		14/01/2022 10:19 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_SW410		14/01/2022 10:20 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_SW416		14/01/2022 11:13 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_PW415		14/01/2022 11:17 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_SW414		14/01/2022 11:27 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

Environmental Division
Perth
Work Order Reference
EP2200400

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

COC#: **32403** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW413		14/01/2022 11:33 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_SW412		14/01/2022 11:47 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_PW411		14/01/2022 11:53 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: **32403** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW406	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW405	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW407	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW408	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW409	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW410	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_SW416	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_PW415	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_SW414	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32403 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_PW413	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_SW412	Surface Waters WATER	Water	- NT-01 Major Cations (Ca, Mg, Na, K) - EA025H Suspended Solids - Standard Level - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_PW411	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **32403** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW406	Clear Plastic Bottle - Natural	250 mL	00070621200513	Green	No	
001	0089_SW406	HDPE (no PTFE)	20 mL	00352101061805	Grey	No	
001	0089_SW406	HDPE (no PTFE)	20 mL	00352101061661	Grey	No	
002	0089_PW405	Clear Plastic Bottle - Natural	250 mL	00070621200521	Green	No	
002	0089_PW405	HDPE (no PTFE)	20 mL	00352101061759	Grey	No	
002	0089_PW405	HDPE (no PTFE)	20 mL	00352101061659	Grey	No	
003	0089_PW407	HDPE (no PTFE)	20 mL	00352010011005	Grey	No	
003	0089_PW407	HDPE (no PTFE)	20 mL	00352010010940	Grey	No	
003	0089_PW407	Clear Plastic Bottle - Natural	250 mL	00070621200260	Green	No	
004	0089_SW408	Clear Plastic Bottle - Natural	250 mL	00070621200510	Green	No	
004	0089_SW408	HDPE (no PTFE)	20 mL	00352101061742	Grey	No	
004	0089_SW408	HDPE (no PTFE)	20 mL	00352010011135	Grey	No	
004	0089_SW408	HDPE (no PTFE)	20 mL	00352010010954	Grey	No	
004	0089_SW408	HDPE (no PTFE)	20 mL	00352101061807	Grey	No	
005	0089_PW409	Clear Plastic Bottle - Natural	250 mL	00070621200528	Green	No	
005	0089_PW409	HDPE (no PTFE)	20 mL	00352101061693	Grey	No	
005	0089_PW409	HDPE (no PTFE)	20 mL	00352101061627	Grey	No	
006	0089_SW410	HDPE (no PTFE)	20 mL	00352101061741	Grey	No	
006	0089_SW410	HDPE (no PTFE)	20 mL	00352101061812	Grey	No	
006	0089_SW410	Clear Plastic Bottle - Natural	250 mL	00070621200729	Green	No	
007	0089_SW416	HDPE (no PTFE)	20 mL	00352101061716	Grey	No	
007	0089_SW416	Clear Plastic Bottle - Natural	250 mL	00070621200522	Green	No	
007	0089_SW416	HDPE (no PTFE)	20 mL	00352101061625	Grey	No	
008	0089_PW415	Clear Plastic Bottle - Natural	250 mL	00070621200507	Green	No	
008	0089_PW415	HDPE (no PTFE)	20 mL	00352101061687	Grey	No	
008	0089_PW415	HDPE (no PTFE)	20 mL	00352101061721	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 32403 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_SW414	Clear Plastic Bottle - Natural	250 mL	00070621200292	Green	No	
009	0089_SW414	HDPE (no PTFE)	20 mL	00352101061750	Grey	No	
009	0089_SW414	HDPE (no PTFE)	20 mL	00352101061827	Grey	No	
010	0089_PW413	Clear Plastic Bottle - Natural	250 mL	00070621200483	Green	No	
010	0089_PW413	HDPE (no PTFE)	20 mL	00352101061648	Grey	No	
010	0089_PW413	HDPE (no PTFE)	20 mL	00352101061595	Grey	No	
011	0089_SW412	Clear Plastic Bottle - Natural	250 mL	00070621200557	Green	No	
011	0089_SW412	HDPE (no PTFE)	20 mL	00352101061839	Grey	No	
011	0089_SW412	HDPE (no PTFE)	20 mL	00352101061639	Grey	No	
012	0089_PW411	HDPE (no PTFE)	20 mL	00352101061788	Grey	No	
012	0089_PW411	HDPE (no PTFE)	20 mL	00352101061770	Grey	No	
012	0089_PW411	Clear Plastic Bottle - Natural	250 mL	00070621200310	Green	No	

Total Bottle Count: ALS: 38, Non ALS: 0

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200400**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32403	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Jan-2022 16:20	Issue Date	: 17-Jan-2022
Client Requested Due Date	: 25-Jan-2022	Scheduled Reporting Date	: **25-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2200400-001	14-Jan-2022 09:28	0089_SW406_220114	✓	✓	✓	✓
EP2200400-002	14-Jan-2022 09:32	0089_PW405_220114	✓	✓	✓	✓
EP2200400-003	14-Jan-2022 09:45	0089_PW407_220114	✓	✓	✓	✓
EP2200400-004	14-Jan-2022 10:06	0089_SW408_220114	✓	✓	✓	✓
EP2200400-005	14-Jan-2022 10:19	0089_PW409_220114	✓	✓	✓	✓
EP2200400-006	14-Jan-2022 10:20	0089_SW410_220114	✓	✓	✓	✓
EP2200400-007	14-Jan-2022 11:13	0089_SW416_220114	✓	✓	✓	✓
EP2200400-008	14-Jan-2022 11:17	0089_PW415_220114	✓	✓	✓	✓
EP2200400-009	14-Jan-2022 11:27	0089_SW414_220114	✓	✓	✓	✓
EP2200400-010	14-Jan-2022 11:33	0089_PW413_220114	✓	✓	✓	✓
EP2200400-011	14-Jan-2022 11:47	0089_SW412_220114	✓	✓	✓	✓
EP2200400-012	14-Jan-2022 11:53	0089_PW411_220114	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200400**	Page	: 1 of 15
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Jan-2022 16:20
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32403	Issue Date	: 21-Jan-2022 10:44
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19		
No. of samples received	: 12		
No. of samples analysed	: 12		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW406_220114	0089_SW408_220114	0089_SW410_220114	0089_SW416_220114	0089_SW414_220114
				Sampling date / time	14-Jan-2022 09:28	14-Jan-2022 10:06	14-Jan-2022 10:20	14-Jan-2022 11:13	14-Jan-2022 11:27
Compound	CAS Number	LOR	Unit		EP2200400-001	EP2200400-004	EP2200400-006	EP2200400-007	EP2200400-009
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		126	124	126	120	121
Total Alkalinity as CaCO3	----	1	mg/L		126	124	126	120	121
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2630	2600	2630	2640	2660
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20000	20000	20500	20200	20300
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		459	455	452	454	446
Magnesium	7439-95-4	1	mg/L		1460	1450	1440	1440	1430
Sodium	7440-23-5	1	mg/L		11500	11300	11300	11300	11200
Potassium	7440-09-7	1	mg/L		582	578	576	578	569
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		621	621	636	627	630
ø Total Cations	----	0.01	meq/L		658	648	647	647	642
ø Ionic Balance	----	0.01	%		2.87	2.17	0.92	1.59	0.88
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW406_220114	0089_SW408_220114	0089_SW410_220114	0089_SW416_220114	0089_SW414_220114
				Sampling date / time	14-Jan-2022 09:28	14-Jan-2022 10:06	14-Jan-2022 10:20	14-Jan-2022 11:13	14-Jan-2022 11:27
Compound	CAS Number	LOR	Unit		EP2200400-001	EP2200400-004	EP2200400-006	EP2200400-007	EP2200400-009
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW406_220114	0089_SW408_220114	0089_SW410_220114	0089_SW416_220114	0089_SW414_220114
				Sampling date / time	14-Jan-2022 09:28	14-Jan-2022 10:06	14-Jan-2022 10:20	14-Jan-2022 11:13	14-Jan-2022 11:27
					EP2200400-001	EP2200400-004	EP2200400-006	EP2200400-007	EP2200400-009
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**115**	**111**	**110**	**107**	**108**
13C8-PFOA	----	0.02	%		**92.0**	**91.3**	**91.2**	**92.1**	**88.0**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW412_220114	----	----	----	----
				Sampling date / time	14-Jan-2022 11:47	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200400-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**119**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**119**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2670**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20800**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**456**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1460**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11500**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**589**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**645**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**658**	----	----	----	----
ø Ionic Balance	----	0.01	%		**1.04**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW412_220114	----	----	----	----
				Sampling date / time	14-Jan-2022 11:47	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200400-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW412_220114	----	----	----	----
				Sampling date / time	14-Jan-2022 11:47	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200400-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	----	----	----	----
13C8-PFOA	----	0.02	%		**93.3**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW405_220114	0089_PW407_220114	0089_PW409_220114	0089_PW415_220114	0089_PW413_220114
				Sampling date / time	14-Jan-2022 09:32	14-Jan-2022 09:45	14-Jan-2022 10:19	14-Jan-2022 11:17	14-Jan-2022 11:33
					EP2200400-002	EP2200400-003	EP2200400-005	EP2200400-008	EP2200400-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**122**	**101**	**130**	**114**	**125**
Total Alkalinity as CaCO3	----	1	mg/L		**122**	**101**	**130**	**114**	**125**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2700**	**2690**	**2660**	**2650**	**2710**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20100**	**20400**	**20300**	**20700**	**21100**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**457**	**457**	**460**	**436**	**472**
Magnesium	7439-95-4	1	mg/L		**1470**	**1480**	**1460**	**1410**	**1500**
Sodium	7440-23-5	1	mg/L		**11600**	**11600**	**11400**	**11000**	**11800**
Potassium	7440-09-7	1	mg/L		**588**	**593**	**584**	**558**	**607**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**626**	**633**	**631**	**641**	**654**
ø Total Cations	----	0.01	meq/L		**663**	**664**	**654**	**630**	**676**
ø Ionic Balance	----	0.01	%		**2.93**	**2.38**	**1.81**	**0.85**	**1.63**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW405_220114	0089_PW407_220114	0089_PW409_220114	0089_PW415_220114	0089_PW413_220114
				Sampling date / time	14-Jan-2022 09:32	14-Jan-2022 09:45	14-Jan-2022 10:19	14-Jan-2022 11:17	14-Jan-2022 11:33
					EP2200400-002	EP2200400-003	EP2200400-005	EP2200400-008	EP2200400-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW405_220114	0089_PW407_220114	0089_PW409_220114	0089_PW415_220114	0089_PW413_220114
				Sampling date / time	14-Jan-2022 09:32	14-Jan-2022 09:45	14-Jan-2022 10:19	14-Jan-2022 11:17	14-Jan-2022 11:33
Compound	CAS Number	LOR	Unit		EP2200400-002	EP2200400-003	EP2200400-005	EP2200400-008	EP2200400-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	**108**	**116**	**105**	**112**
13C8-PFOA	----	0.02	%		**93.0**	**93.6**	**92.2**	**94.6**	**90.1**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW411_220114	----	----	----	----
				Sampling date / time	14-Jan-2022 11:53	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200400-012	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**111**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**111**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2630**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20500**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**436**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1400**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11000**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**558**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**635**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**630**	----	----	----	----
ø Ionic Balance	----	0.01	%		**0.44**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW411_220114	----	----	----	----
				Sampling date / time	14-Jan-2022 11:53	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200400-012	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	**0089_PW411_220114**	----	----	----	----
				Sampling date / time	14-Jan-2022 11:53	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2200400-012**	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	----	----	----	----
13C8-PFOA	----	0.02	%		**88.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200400**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Jan-2022
C-O-C number	: 32403	Issue Date	: 21-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19		
No. of samples received	: 12		
No. of samples analysed	: 12		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4123952)									
EP2200343-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	124	0.0	0% - 20%
EP2200400-009	0089_SW414_220114	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	121	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	121	120	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4124087)									
EP2200231-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	218	209	4.0	0% - 20%
EP2200400-003	0089_PW407_220114	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2690	2680	0.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4124088)									
EP2200231-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3640	3600	1.1	0% - 20%
EP2200400-003	0089_PW407_220114	ED045G: Chloride	16887-00-6	1	mg/L	20400	20500	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4125445)									
EP2200400-001	0089_SW406_220114	ED093F: Calcium	7440-70-2	1	mg/L	459	465	1.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1480	1.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11700	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	582	594	2.0	0% - 20%
EP2200400-011	0089_SW412_220114	ED093F: Calcium	7440-70-2	1	mg/L	456	450	1.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1440	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11300	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	589	582	1.2	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4128176)									
EP2200400-004	0089_SW408_220114	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4128176)									
EP2200400-004	0089_SW408_220114	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4128176)									
EP2200400-004	0089_SW408_220114	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4128176)									
EP2200400-004	0089_SW408_220114	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4128176) - continued									
EP2200400-004	0089_SW408_220114	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4128176)									
EP2200400-004	0089_SW408_220114	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4123952)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	106	81.2	126
				<1	200 mg/L	99.4	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4124087)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	87.7	113
				<1	500 mg/L	101	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4124088)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	87.9	114
				<1	1000 mg/L	106	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4125445)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.3	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	92.8	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.5	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4128176)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	93.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	97.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	99.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4128176)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	103	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	84.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4128176) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	112	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4128176)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	99.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	113	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	112	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	111	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	110	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	108	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4128176)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	102	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	90.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	100	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	81.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4124087)							
EP2200231-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	82.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4124088)							
EP2200231-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	71.6	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200400**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Jan-2022
Site	: DEF19009/Stirling SW/PW - AG	Issue Date	: 21-Jan-2022
Sampler	: [redacted]	No. of samples received	: 12
Order number	: DEF19009/730	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	17	5.88	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	17	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW406_220114,	0089_PW405_220114,	**14-Jan-2022**	**----**	----	----	**17-Jan-2022**	28-Jan-2022	✓
0089_PW407_220114,	0089_SW408_220114,							
0089_PW409_220114,	0089_SW410_220114,							
0089_SW416_220114,	0089_PW415_220114,							
0089_SW414_220114,	0089_PW413_220114,							
0089_SW412_220114,	0089_PW411_220114							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW406_220114,	0089_PW405_220114,	**14-Jan-2022**	**----**	----	----	**20-Jan-2022**	11-Feb-2022	✓
0089_PW407_220114,	0089_SW408_220114,							
0089_PW409_220114,	0089_SW410_220114,							
0089_SW416_220114,	0089_PW415_220114,							
0089_SW414_220114,	0089_PW413_220114,							
0089_SW412_220114,	0089_PW411_220114							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW406_220114,	0089_PW405_220114,	**14-Jan-2022**	**----**	----	----	**20-Jan-2022**	11-Feb-2022	✓
0089_PW407_220114,	0089_SW408_220114,							
0089_PW409_220114,	0089_SW410_220114,							
0089_SW416_220114,	0089_PW415_220114,							
0089_SW414_220114,	0089_PW413_220114,							
0089_SW412_220114,	0089_PW411_220114							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW406_220114,	0089_PW405_220114,	**14-Jan-2022**	**----**	----	----	**19-Jan-2022**	21-Jan-2022	✓
0089_PW407_220114,	0089_SW408_220114,							
0089_PW409_220114,	0089_SW410_220114,							
0089_SW416_220114,	0089_PW415_220114,							
0089_SW414_220114,	0089_PW413_220114,							
0089_SW412_220114,	0089_PW411_220114							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW406_220114,	0089_PW405_220114,	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓
0089_PW407_220114,	0089_SW408_220114,							
0089_PW409_220114,	0089_SW410_220114,							
0089_SW416_220114,	0089_PW415_220114,							
0089_SW414_220114,	0089_PW413_220114,							
0089_SW412_220114,	0089_PW411_220114							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW406_220114,	0089_PW405_220114,	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓
0089_PW407_220114,	0089_SW408_220114,							
0089_PW409_220114,	0089_SW410_220114,							
0089_SW416_220114,	0089_PW415_220114,							
0089_SW414_220114,	0089_PW413_220114,							
0089_SW412_220114,	0089_PW411_220114							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_SW406_220114,	0089_PW405_220114,	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓
0089_PW407_220114,	0089_SW408_220114,							
0089_PW409_220114,	0089_SW410_220114,							
0089_SW416_220114,	0089_PW415_220114,							
0089_SW414_220114,	0089_PW413_220114,							
0089_SW412_220114,	0089_PW411_220114							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW406_220114,	0089_PW405_220114,	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓
0089_PW407_220114,	0089_SW408_220114,							
0089_PW409_220114,	0089_SW410_220114,							
0089_SW416_220114,	0089_PW415_220114,							
0089_SW414_220114,	0089_PW413_220114,							
0089_SW412_220114,	0089_PW411_220114							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_SW406_220114,	0089_PW405_220114,	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**20-Jan-2022**	13-Jul-2022	✓
0089_PW407_220114,	0089_SW408_220114,							
0089_PW409_220114,	0089_SW410_220114,							
0089_SW416_220114,	0089_PW415_220114,							
0089_SW414_220114,	0089_PW413_220114,							
0089_SW412_220114,	0089_PW411_220114							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	17	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: 32404 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 14/01 1620	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD405		14/01/2022 09:36 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_SD407		14/01/2022 09:44 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD409		14/01/2022 10:22 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD415		14/01/2022 11:18 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
005	0089_SD413		14/01/2022 11:30 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
006	0089_SD411		14/01/2022 11:51 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

Environmental Division
Perth
Work Order Reference
EP2200401

Telephone : -- 61-8-9406 1301

CHAIN OF CUSTODY

(ALS) COC#: **32404** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD405	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_SD407	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD409	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD415	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0089_SD413	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0089_SD411	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 32404 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD405	HDPE Soil Jar	200 mL	00621019083968	Grey	No	
002	0089_SD407	HDPE Soil Jar	200 mL	00621019083878	Grey	No	
003	0089_SD409	HDPE Soil Jar	200 mL	00621019083897	Grey	No	
004	0089_SD415	HDPE Soil Jar	200 mL	00621019083914	Grey	No	
005	0089_SD413	HDPE Soil Jar	200 mL	00621019083891	Grey	No	
006	0089_SD411	HDPE Soil Jar	200 mL	00621019083899	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2200401**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 32404	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED AG		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 14-Jan-2022 16:20	Issue Date	: 17-Jan-2022
Client Requested Due Date	: 25-Jan-2022	Scheduled Reporting Date	: **25-Jan-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2200401-001	14-Jan-2022 09:36	0089_SD405_220114	✓	✓
EP2200401-002	14-Jan-2022 09:44	0089_SD407_220114	✓	✓
EP2200401-003	14-Jan-2022 10:22	0089_SD409_220114	✓	✓
EP2200401-004	14-Jan-2022 11:18	0089_SD415_220114	✓	✓
EP2200401-005	14-Jan-2022 11:30	0089_SD413_220114	✓	✓
EP2200401-006	14-Jan-2022 11:51	0089_SD411_220114	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2200401**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Jan-2022 16:20
Order number	: DEF19009/730	Date Analysis Commenced	: 20-Jan-2022
C-O-C number	: 32404	Issue Date	: 25-Jan-2022 16:37
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD405_220114	0089_SD407_220114	0089_SD409_220114	0089_SD415_220114	0089_SD413_220114
				Sampling date / time	14-Jan-2022 09:36	14-Jan-2022 09:44	14-Jan-2022 10:22	14-Jan-2022 11:18	14-Jan-2022 11:30
					EP2200401-001	EP2200401-002	EP2200401-003	EP2200401-004	EP2200401-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**26.3**	**27.8**	**29.0**	**25.2**	**25.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_220114	0089_SD407_220114	0089_SD409_220114	0089_SD415_220114	0089_SD413_220114
				Sampling date / time	14-Jan-2022 09:36	14-Jan-2022 09:44	14-Jan-2022 10:22	14-Jan-2022 11:18	14-Jan-2022 11:30
Compound	CAS Number	LOR	Unit		EP2200401-001	EP2200401-002	EP2200401-003	EP2200401-004	EP2200401-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**112**	**119**	**117**	**115**	**112**
13C8-PFOA	----	0.0002	%		**106**	**102**	**98.5**	**110**	**102**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD411_220114	----	----	----	----
			Sampling date / time	14-Jan-2022 11:51	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2200401-006	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**25.7**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD411_220114	----	----	----	----
				Sampling date / time	14-Jan-2022 11:51	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2200401-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**112**	----	----	----	----
13C8-PFOA	----	0.0002	%		**102**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2200401**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Jan-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 20-Jan-2022
C-O-C number	: 32404	Issue Date	: 25-Jan-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4130058)									
EP2200341-003	Anonymous	EA055: Moisture Content	----	0.1	%	18.3	17.9	2.6	0% - 20%
EP2200401-005	0089_SD413_220114	EA055: Moisture Content	----	0.1	%	25.2	25.2	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4133731)									
EP2200401-001	0089_SD405_220114	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2201360-020	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0014	0.0014	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0012	0.0013	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0050	0.0058	15.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0036	0.0040	12.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4133731)									
EP2200401-001	0089_SD405_220114	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4133731) - continued									
EP2200401-001	0089_SD405_220114	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2201360-020	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0018	0.0019	6.2	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0004	0.0003	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0012	0.0011	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4133731)									
EP2200401-001	0089_SD405_220114	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2201360-020	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4133731)									
EP2200401-001	0089_SD405_220114	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2201360-020	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4133731)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4133731)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	83.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4133731)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.5	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.6	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.5	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4133731)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	86.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	75.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	98.4	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4133731) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	88.8	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4133731)							
EP2200401-001	0089_SD405_220114	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	88.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	82.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	81.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	82.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	79.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	83.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4133731)							
EP2200401-001	0089_SD405_220114	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	82.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	96.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	100	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	92.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	81.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	88.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	90.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	88.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	99.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	88.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	108	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4133731)							
EP2200401-001	0089_SD405_220114	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	89.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	108	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	92.9	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	92.0	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	100	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	88.4	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4133731) - continued							
EP2200401-001	0089_SD405_220114	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	84.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4133731)							
EP2200401-001	0089_SD405_220114	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	84.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	70.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	88.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	84.0	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2200401**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 14-Jan-2022
Site	: DEF19009/Stirling SED AG	Issue Date	: 25-Jan-2022
Sampler	: [redacted]	No. of samples received	: 6
Order number	: DEF19009/730	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD405_220114, 0089_SD407_220114, 0089_SD409_220114, 0089_SD415_220114, 0089_SD413_220114, 0089_SD411_220114	**14-Jan-2022**	**----**	----	----	**20-Jan-2022**	28-Jan-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD405_220114, 0089_SD407_220114, 0089_SD409_220114, 0089_SD415_220114, 0089_SD413_220114, 0089_SD411_220114	**14-Jan-2022**	**24-Jan-2022**	13-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD405_220114, 0089_SD407_220114, 0089_SD409_220114, 0089_SD415_220114, 0089_SD413_220114, 0089_SD411_220114	**14-Jan-2022**	**24-Jan-2022**	13-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD405_220114, 0089_SD407_220114, 0089_SD409_220114, 0089_SD415_220114, 0089_SD413_220114, 0089_SD411_220114	**14-Jan-2022**	**24-Jan-2022**	13-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD405_220114, 0089_SD407_220114, 0089_SD409_220114, 0089_SD415_220114, 0089_SD413_220114, 0089_SD411_220114	**14-Jan-2022**	**24-Jan-2022**	13-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD405_220114, 0089_SD407_220114, 0089_SD409_220114, 0089_SD415_220114, 0089_SD413_220114, 0089_SD411_220114	**14-Jan-2022**	**24-Jan-2022**	13-Jul-2022	✓	**25-Jan-2022**	05-Mar-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Cardno (WA) Pty Ltd	**Contact Name :** [redacted]	**Purchase Order :** DEF19009/730	**COC Number :** DEF19009/730 -01
Office Address : 11 Harvest Terrace, West perth, WA, 6005		**PROJECT Number :** WA_0089_PFASOMP	**Eurofins | mgt quote ID :**
	Email for COC/SRN/Results : [redacted]	**PROJECT Name :** DEF19009/Stirling	**Data output format: PDF; ESDAT**

Special Directions & Comments :
Please sendESdat files to [redacted] with the project No in the header file

Please send email invoice to [redacted]

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC201_220110	10/01/2022	Water	X
2	0089_QC202_220110	10/01/2022	Water	X
3	0089_QC203_220110	10/01/2022	Soil	X
4	0089_QC204_220110	10/01/2022	Water	X
5	0089_QC205_220110	10/01/2022	Water	X
6	0089_QC206_220110	10/01/2022	Water	X
7	0089_QC207_220110	10/01/2022	Water	X
8	0089_QC208_220110	10/01/2022	Water	X
9	0089_QC209_220110	10/01/2022	Soil	X
10	0089_QC210_220110	10/01/2022	Water	X
11	0089_QC211_220110	10/01/2022	Water	X
12	0089_QC212_220110	10/01/2022	Water	X

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	

Sample comments:

Laboratory Staff

Relinquished By: Maelle Bourdais
Date & Time : 11/01/2022
Signature:

Received By: [redacted]
Date & Time : 11/01/22 15:15
Signature: [redacted]

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number: 854607

11/01/22 15:15
16.1 (Yes) No
14.8
5.0
15

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Sample Receipt Advice

Company name:	Cardno (WA)
Contact name:	[redacted]
Project name:	DEF19009/Stirling
Project ID:	WA_0089_PFASOMP
Turnaround time:	5 Day
Date/Time received	Jan 11, 2022 3:15 PM
Eurofins reference	854607

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 15 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]

Results will be delivered electronically via email to [redacted] - [redacted]

Note: A copy of these results will also be delivered to the general Cardno (WA) email address.

Global Leader - Results you can trust

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Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 854607
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 11, 2022 3:15 PM
Due: Jan 18, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_220110	Jan 10, 2022		Water	L22-Ja05700		X
2	0089_QC202_220110	Jan 10, 2022		Water	L22-Ja05701		X
3	0089_QC203_220110	Jan 10, 2022		Soil	L22-Ja05702	X	X
4	0089_QC204_220110	Jan 10, 2022		Water	L22-Ja05703		X
5	0089_QC205_220110	Jan 10, 2022		Water	L22-Ja05704		X
6	0089_QC206_	Jan 10, 2022		Water	L22-Ja05705		X

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Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 854607
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 11, 2022 3:15 PM
Due: Jan 18, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	220110						
7	0089_QC207_220110	Jan 10, 2022		Water	L22-Ja05706		X
8	0089_QC208_220110	Jan 10, 2022		Water	L22-Ja05707		X
9	0089_QC209_220110	Jan 10, 2022		Soil	L22-Ja05708	X	X
10	0089_QC210_220110	Jan 10, 2022		Water	L22-Ja05709		X
11	0089_QC211_220110	Jan 10, 2022		Water	L22-Ja05710		X
12	0089_QC212_220110	Jan 10, 2022		Water	L22-Ja05711		X

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Company Name: Cardno (WA)
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Fax: 08 9388 3831

Received: Jan 11, 2022 3:15 PM
Due: Jan 18, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370		
Melbourne Laboratory - NATA # 1261 Site # 1254		
Sydney Laboratory - NATA # 1261 Site # 18217		
Brisbane Laboratory - NATA # 1261 Site # 20794	X	X
Mayfield Laboratory - NATA # 1261 Site # 25079		
External Laboratory		
Test Counts	2	12

Cardno Consulting WA
11 Harvest Terrace
West Perth
WA 6005

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **854607-S**
Project name DEF19009/Stirling
Project ID WA_0089_PFASOMP
Received Date Jan 11, 2022

Client Sample ID			**0089_QC203_220110**	**0089_QC209_220110**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L22-Ja05702**	**L22-Ja05708**
Date Sampled			**Jan 10, 2022**	**Jan 10, 2022**
Test/Reference	LOR	Unit		
% Moisture	1	%	27	29
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	63	59
13C5-PFPeA (surr.)	1	%	70	80
13C5-PFHxA (surr.)	1	%	86	85
13C4-PFHpA (surr.)	1	%	85	81
13C8-PFOA (surr.)	1	%	94	93
13C5-PFNA (surr.)	1	%	92	94
13C6-PFDA (surr.)	1	%	85	79
13C2-PFUnDA (surr.)	1	%	88	78
13C2-PFDoDA (surr.)	1	%	84	81
13C2-PFTeDA (surr.)	1	%	112	113
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10

Client Sample ID			0089_QC203_220110	0089_QC209_220110
Sample Matrix			Soil	Soil
Eurofins Sample No.			L22-Ja05702	L22-Ja05708
Date Sampled			Jan 10, 2022	Jan 10, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
13C8-FOSA (surr.)	1	%	103	108
D3-N-MeFOSA (surr.)	1	%	85	78
D5-N-EtFOSA (surr.)	1	%	76	78
D7-N-MeFOSE (surr.)	1	%	115	111
D9-N-EtFOSE (surr.)	1	%	104	101
D5-N-EtFOSAA (surr.)	1	%	81	74
D3-N-MeFOSAA (surr.)	1	%	78	81
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	93	92
18O2-PFHxS (surr.)	1	%	96	86
13C8-PFOS (surr.)	1	%	100	98
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	33	30
13C2-6:2 FTSA (surr.)	1	%	49	44
13C2-8:2 FTSA (surr.)	1	%	64	65
13C2-10:2 FTSA (surr.)	1	%	73	83
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Brisbane	Jan 11, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jan 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jan 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jan 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jan 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 854607
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 11, 2022 3:15 PM
Due: Jan 18, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_220110	Jan 10, 2022		Water	L22-Ja05700		X
2	0089_QC202_220110	Jan 10, 2022		Water	L22-Ja05701		X
3	0089_QC203_220110	Jan 10, 2022		Soil	L22-Ja05702	X	X
4	0089_QC204_220110	Jan 10, 2022		Water	L22-Ja05703		X
5	0089_QC205_220110	Jan 10, 2022		Water	L22-Ja05704		X
6	0089_QC206_	Jan 10, 2022		Water	L22-Ja05705		X

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Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	220110						
7	0089_QC207_220110	Jan 10, 2022		Water	L22-Ja05706		X
8	0089_QC208_220110	Jan 10, 2022		Water	L22-Ja05707		X
9	0089_QC209_220110	Jan 10, 2022		Soil	L22-Ja05708	X	X
10	0089_QC210_220110	Jan 10, 2022		Water	L22-Ja05709		X
11	0089_QC211_220110	Jan 10, 2022		Water	L22-Ja05710		X
12	0089_QC212_220110	Jan 10, 2022		Water	L22-Ja05711		X

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Company Name:	Cardno (WA)	**Order No.:**	DEF19009/730	**Received:**	Jan 11, 2022 3:15 PM
Address:	11 Harvest Terrace West Perth WA 6005	**Report #:**	854607	**Due:**	Jan 18, 2022
		Phone:	08 9273 3888	**Priority:**	5 Day
		Fax:	08 9388 3831	**Contact Name:**	[redacted]
Project Name:	DEF19009/Stirling				
Project ID:	WA_0089_PFASOMP				

Eurofins Analytical Services Manager : [redacted]

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Melbourne Laboratory - NATA # 1261 Site # 1254		
Sydney Laboratory - NATA # 1261 Site # 18217		
Brisbane Laboratory - NATA # 1261 Site # 20794	X	X
Mayfield Laboratory - NATA # 1261 Site # 25079		
External Laboratory		
Test Counts	2	12

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.4
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	87			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	108			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	98			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	84			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	93			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	88			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	92			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	90			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	94			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	76			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	54			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	78			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	97			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	98			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	95			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	76			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	94			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	107			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	94			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	103			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	86			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	88			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	116			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	117			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	101			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	79			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L22-Ja05702	CP	%	85			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja05702	CP	%	85			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja05702	CP	%	85			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja05702	CP	%	97			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja05702	CP	%	87			50-150	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja05702	CP	%	84			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja05702	CP	%	85			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja05702	CP	%	93			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja05702	CP	%	86			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja05702	CP	%	74			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja05702	CP	%	54			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L22-Ja05702	CP	%	83			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja05702	CP	%	103			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja05702	CP	%	98			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja05702	CP	%	101			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja05702	CP	%	79			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja05702	CP	%	75			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja05702	CP	%	106			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L22-Ja05702	CP	%	80			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja05702	CP	%	112			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja05702	CP	%	75			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja05702	CP	%	78			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja05702	CP	%	95			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja05702	CP	%	105			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja05702	CP	%	100			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja05702	CP	%	114			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja05702	CP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja05702	CP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja05702	CP	%	118			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja05702	CP	%	88			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L22-Ja05708	CP	%	29	27	6.0	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja05708	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja05708	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja05708	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja05708	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS (QLD)

[redacted]
[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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West Perth
WA 6005

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Accreditation Number 2377
Site Number 2370

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Attention: [redacted]

Report **854607-W**
Project name DEF19009/Stirling
Project ID WA_0089_PFASOMP
Received Date Jan 11, 2022

Client Sample ID			**0089_QC201_220110**	**0089_QC202_220110**	**0089_QC204_220110**	**0089_QC205_220110**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-Ja05700**	**L22-Ja05701**	**L22-Ja05703**	**L22-Ja05704**
Date Sampled			**Jan 10, 2022**	**Jan 10, 2022**	**Jan 10, 2022**	**Jan 10, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.05	< 0.01	0.02	0.06
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.19	< 0.01	0.08	0.34
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.01	[N09]0.09
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]1.6	[N09]1.4
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	88	84	84	131
13C5-PFPeA (surr.)	1	%	81	89	82	125
13C5-PFHxA (surr.)	1	%	92	126	100	128
13C4-PFHpA (surr.)	1	%	94	106	94	135
13C8-PFOA (surr.)	1	%	78	105	54	51
13C5-PFNA (surr.)	1	%	93	93	39	70
13C6-PFDA (surr.)	1	%	81	64	74	15
13C2-PFUnDA (surr.)	1	%	80	73	105	57
13C2-PFDoDA (surr.)	1	%	84	78	94	65
13C2-PFTeDA (surr.)	1	%	163	72	72	36
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	87	66	106	102
D3-N-MeFOSA (surr.)	1	%	97	79	124	93

Client Sample ID			0089_QC201_220110	0089_QC202_220110	0089_QC204_220110	0089_QC205_220110
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Ja05700	L22-Ja05701	L22-Ja05703	L22-Ja05704
Date Sampled			Jan 10, 2022	Jan 10, 2022	Jan 10, 2022	Jan 10, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	97	99	117	107
D7-N-MeFOSE (surr.)	1	%	50	52	93	62
D9-N-EtFOSE (surr.)	1	%	59	55	89	66
D5-N-EtFOSAA (surr.)	1	%	45	51	53	46
D3-N-MeFOSAA (surr.)	1	%	49	47	62	44
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.09	< 0.01	0.02	0.05
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.03	< 0.01	< 0.01	0.02
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.08	< 0.01	[N09]0.04	[N09]0.17
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.18	< 0.01	[N09]8.1	[N09]8.9
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	[N09]2.5	[N09]5.8
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.02	[N09]0.03	[N09]0.99	[N09]42
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	77	118	88	135
18O2-PFHxS (surr.)	1	%	88	108	77	124
13C8-PFOS (surr.)	1	%	82	87	75	143
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	72	127	68	164
13C2-6:2 FTSA (surr.)	1	%	43	109	50	172
13C2-8:2 FTSA (surr.)	1	%	61	82	49	51
13C2-10:2 FTSA (surr.)	1	%	66	104	79	56
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.2	0.03	9.09	50.9
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.02	0.03	2.59	43.4
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.2	0.03	10.69	52.3
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.53	< 0.05	10.82	52.84
Sum of PFASs (n=30)*	0.1	ug/L	0.64	< 0.1	13.36	58.84

Client Sample ID			0089_QC206_220110	0089_QC207_220110	0089_QC208_220110	0089_QC210_220110
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Ja05705	L22-Ja05706	L22-Ja05707	L22-Ja05709
Date Sampled			Jan 10, 2022	Jan 10, 2022	Jan 10, 2022	Jan 10, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.34
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.47
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	1.5
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.13
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.34

Client Sample ID			0089_QC206_220110	0089_QC207_220110	0089_QC208_220110	0089_QC210_220110
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Ja05705	L22-Ja05706	L22-Ja05707	L22-Ja05709
Date Sampled			Jan 10, 2022	Jan 10, 2022	Jan 10, 2022	Jan 10, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	91	90	104	81
13C5-PFPeA (surr.)	1	%	84	111	117	57
13C5-PFHxA (surr.)	1	%	110	140	154	125
13C4-PFHpA (surr.)	1	%	99	112	124	84
13C8-PFOA (surr.)	1	%	108	112	109	55
13C5-PFNA (surr.)	1	%	112	105	105	89
13C6-PFDA (surr.)	1	%	76	59	69	35
13C2-PFUnDA (surr.)	1	%	87	64	82	68
13C2-PFDoDA (surr.)	1	%	81	54	69	77
13C2-PFTeDA (surr.)	1	%	73	23	33	83
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	[N09]0.06
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	74	75	85	63
D3-N-MeFOSA (surr.)	1	%	76	69	93	88
D5-N-EtFOSA (surr.)	1	%	91	72	106	97
D7-N-MeFOSE (surr.)	1	%	53	45	63	56
D9-N-EtFOSE (surr.)	1	%	54	49	72	65
D5-N-EtFOSAA (surr.)	1	%	49	53	63	[N09]55
D3-N-MeFOSAA (surr.)	1	%	50	59	65	48
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.42
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.08
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.39
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.46
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]3.4
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.24
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]8.6
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]< 0.01
13C3-PFBS (surr.)	1	%	106	123	156	78
18O2-PFHxS (surr.)	1	%	111	129	137	69
13C8-PFOS (surr.)	1	%	96	94	96	62

Client Sample ID			0089_QC206_220110	0089_QC207_220110	0089_QC208_220110	0089_QC210_220110
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Ja05705	L22-Ja05706	L22-Ja05707	L22-Ja05709
Date Sampled			Jan 10, 2022	Jan 10, 2022	Jan 10, 2022	Jan 10, 2022
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.32
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	122	129	138	113
13C2-6:2 FTSA (surr.)	1	%	114	124	97	99
13C2-8:2 FTSA (surr.)	1	%	108	111	93	97
13C2-10:2 FTSA (surr.)	1	%	107	71	98	94
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	12
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	8.94
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	12.34
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	15.52
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	16.76

Client Sample ID			0089_QC211_220110	0089_QC212_220110
Sample Matrix			Water	Water
Eurofins Sample No.			L22-Ja05710	L22-Ja05711
Date Sampled			Jan 10, 2022	Jan 10, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	0.40
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	1.9
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	26
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	[N09]0.76
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	[N09]4.0
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	0.05
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	82	62
13C5-PFPeA (surr.)	1	%	100	131
13C5-PFHxA (surr.)	1	%	118	95
13C4-PFHpA (surr.)	1	%	115	56
13C8-PFOA (surr.)	1	%	111	104
13C5-PFNA (surr.)	1	%	118	54
13C6-PFDA (surr.)	1	%	79	12
13C2-PFUnDA (surr.)	1	%	93	37
13C2-PFDoDA (surr.)	1	%	84	45
13C2-PFTeDA (surr.)	1	%	43	26

Client Sample ID			0089_QC211_220110	0089_QC212_220110
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**L22-Ja05710**	**L22-Ja05711**
Date Sampled			**Jan 10, 2022**	**Jan 10, 2022**
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	[N09]< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	75	67
D3-N-MeFOSA (surr.)	1	%	81	81
D5-N-EtFOSA (surr.)	1	%	84	87
D7-N-MeFOSE (surr.)	1	%	54	46
D9-N-EtFOSE (surr.)	1	%	51	54
D5-N-EtFOSAA (surr.)	1	%	83	[N09]70
D3-N-MeFOSAA (surr.)	1	%	89	58
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	0.77
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	[N09]< 0.1
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.33
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	[N09]2.9
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	[N09]57
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	[N09]2.8
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.02	[N09]130
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	128	68
18O2-PFHxS (surr.)	1	%	133	103
13C8-PFOS (surr.)	1	%	108	104
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	0.08
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	132	106
13C2-6:2 FTSA (surr.)	1	%	133	98
13C2-8:2 FTSA (surr.)	1	%	117	50
13C2-10:2 FTSA (surr.)	1	%	119	45
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	0.02	187
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.02	134
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.02	191
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	220.91
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	226.99

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jan 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jan 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jan 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jan 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 854607
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 11, 2022 3:15 PM
Due: Jan 18, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_220110	Jan 10, 2022		Water	L22-Ja05700		X
2	0089_QC202_220110	Jan 10, 2022		Water	L22-Ja05701		X
3	0089_QC203_220110	Jan 10, 2022		Soil	L22-Ja05702	X	X
4	0089_QC204_220110	Jan 10, 2022		Water	L22-Ja05703		X
5	0089_QC205_220110	Jan 10, 2022		Water	L22-Ja05704		X
6	0089_QC206_	Jan 10, 2022		Water	L22-Ja05705		X

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Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 854607
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 11, 2022 3:15 PM
Due: Jan 18, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	220110						
7	0089_QC207_220110	Jan 10, 2022		Water	L22-Ja05706		X
8	0089_QC208_220110	Jan 10, 2022		Water	L22-Ja05707		X
9	0089_QC209_220110	Jan 10, 2022		Soil	L22-Ja05708	X	X
10	0089_QC210_220110	Jan 10, 2022		Water	L22-Ja05709		X
11	0089_QC211_220110	Jan 10, 2022		Water	L22-Ja05710		X
12	0089_QC212_220110	Jan 10, 2022		Water	L22-Ja05711		X

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Company Name:	Cardno (WA)	**Order No.:**	DEF19009/730	**Received:**	Jan 11, 2022 3:15 PM
Address:	11 Harvest Terrace West Perth WA 6005	**Report #:**	854607	**Due:**	Jan 18, 2022
		Phone:	08 9273 3888	**Priority:**	5 Day
		Fax:	08 9388 3831	**Contact Name:**	[redacted]
Project Name:	DEF19009/Stirling				
Project ID:	WA_0089_PFASOMP				

Eurofins Analytical Services Manager : [redacted]

Sample Detail	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370		
Melbourne Laboratory - NATA # 1261 Site # 1254		
Sydney Laboratory - NATA # 1261 Site # 18217		
Brisbane Laboratory - NATA # 1261 Site # 20794	X	X
Mayfield Laboratory - NATA # 1261 Site # 25079		
External Laboratory		
Test Counts	2	12

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.4
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	126			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	124			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	101			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	107			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	126			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	142			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	122			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	129			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	135			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	127			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	131			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	108			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	123			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	129			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	133			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	114			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	131			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	127			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	113			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	99			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	126			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	139			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	103			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	116			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	116			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	98			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	109			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	133			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	132			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	148			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L22-Ja05700	CP	%	121			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja05700	CP	%	111			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja05700	CP	%	104			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja05700	CP	%	112			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja05700	CP	%	117			50-150	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja05700	CP	%	128			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja05700	CP	%	129			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja05700	CP	%	123			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja05700	CP	%	133			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja05700	CP	%	95			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja05700	CP	%	142			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L22-Ja05700	CP	%	105			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja05700	CP	%	116			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja05700	CP	%	120			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja05700	CP	%	113			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja05700	CP	%	109			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja05700	CP	%	126			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja05700	CP	%	124			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L22-Ja05700	CP	%	82			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja05700	CP	%	90			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja05700	CP	%	95			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja05700	CP	%	108			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja05700	CP	%	95			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja05700	CP	%	112			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja05700	CP	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja05700	CP	%	65			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja05700	CP	%	124			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja05700	CP	%	111			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja05700	CP	%	135			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja05700	CP	%	126			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L22-Ja05710	CP	%	117			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja05710	CP	%	117			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja05710	CP	%	105			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja05710	CP	%	110			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja05710	CP	%	126			50-150	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja05710	CP	%	145			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja05710	CP	%	133			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja05710	CP	%	130			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja05710	CP	%	146			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja05710	CP	%	109			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja05710	CP	%	128			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L22-Ja05710	CP	%	107			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja05710	CP	%	125			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja05710	CP	%	144			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja05710	CP	%	116			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja05710	CP	%	128			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja05710	CP	%	134			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja05710	CP	%	139			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L22-Ja05710	CP	%	95			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja05710	CP	%	98			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja05710	CP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja05710	CP	%	110			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja05710	CP	%	97			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja05710	CP	%	100			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja05710	CP	%	120			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja05710	CP	%	74			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja05710	CP	%	125			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja05710	CP	%	118			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja05710	CP	%	139			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja05710	CP	%	132			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ja05703	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja05703	CP	ug/L	0.02	0.02	1.0	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja05703	CP	ug/L	0.08	0.08	6.0	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja05703	CP	ug/L	0.01	0.01	13	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja05703	CP	ug/L	1.6	1.7	6.0	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ja05703	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja05703	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja05703	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja05703	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja05703	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja05703	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja05703	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ja05703	CP	ug/L	0.02	0.02	4.0	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja05703	CP	ug/L	0.04	0.04	17	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja05703	CP	ug/L	8.1	8.6	6.0	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja05703	CP	ug/L	2.5	2.8	11	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja05703	CP	ug/L	0.99	1.0	3.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja05703	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja05703	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ja05709	CP	ug/L	0.34	0.32	4.0	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja05709	CP	ug/L	0.47	0.47	1.0	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja05709	CP	ug/L	1.5	1.3	8.0	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja05709	CP	ug/L	0.13	0.14	11	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja05709	CP	ug/L	0.34	0.32	5.0	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja05709	CP	ug/L	0.01	0.01	7.0	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja05709	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja05709	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja05709	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja05709	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja05709	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ja05709	CP	ug/L	0.06	0.06	6.0	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja05709	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja05709	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja05709	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja05709	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja05709	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja05709	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ja05709	CP	ug/L	0.42	0.41	5.0	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja05709	CP	ug/L	0.08	0.08	6.0	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja05709	CP	ug/L	0.39	0.35	9.0	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja05709	CP	ug/L	0.46	0.43	8.0	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja05709	CP	ug/L	3.4	3.0	11	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja05709	CP	ug/L	0.24	0.22	6.0	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja05709	CP	ug/L	8.6	9.0	4.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja05709	CP	ug/L	< 0.01	0.01	14	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja05709	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja05709	CP	ug/L	0.32	0.35	8.0	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja05709	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja05709	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ja05711	CP	ug/L	0.40	0.40	1.0	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja05711	CP	ug/L	1.9	2.4	23	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja05711	CP	ug/L	26	32	21	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja05711	CP	ug/L	0.76	0.76	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja05711	CP	ug/L	4.0	4.5	12	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja05711	CP	ug/L	0.05	0.05	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja05711	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja05711	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja05711	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja05711	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja05711	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ja05711	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja05711	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja05711	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja05711	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja05711	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja05711	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja05711	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ja05711	CP	ug/L	0.77	0.81	6.0	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja05711	CP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja05711	CP	ug/L	0.33	0.34	6.0	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja05711	CP	ug/L	2.9	3.3	15	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja05711	CP	ug/L	57	66	14	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja05711	CP	ug/L	2.8	3.3	16	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja05711	CP	ug/L	130	140	11	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja05711	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja05711	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja05711	CP	ug/L	0.08	0.10	15	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja05711	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja05711	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS (QLD)

[redacted]
[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

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Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Cardno (WA) Pty Ltd	**Contact Name :** [redacted]	**Purchase Order :** DEF19009/730	**COC Number :** DEF19009/730 -02
Office Address : 11 Harvest Terrace, West perth, WA, 6005		**PROJECT Number :** WA_0089_PFASOMP	**Eurofins | mgt quote ID :**
	Email for COC/SRN/Results : [redacted]	**PROJECT Name :** DEF19009/Stirling	**Data output format:** PDF; ESDAT

Special Directions & Comments :
Please sendESdat files to [redacted] with the project No in the header file

Please send email invoice to [redacted]

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC213_220111	11/01/2022	Water	X
2	0089_QC214_220111	11/01/2022	Soil	X
3	0089_QC215_220112	12/01/2022	Water	X
4	0089_QC216_220112	12/01/2022	Water	X
5	0089_QC217_220112	12/01/2022	Soil	X
6	0089_QC218_220113	13/01/2022	Water	X
7	0089_QC219_220113	13/01/2022	Water	X
8				
9				
10				
11				
12				

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous Iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	

Sample comments:

Laboratory Staff

Relinquished By: Cardno
Date & Time : 12/01/2022
Signature:

R [redacted]
Date & Time : 13/1/22 3:18pm
Signature: [redacted]

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 12.3°C

Report number: 855202

Date/Time: 13/1/22 15:18
Chilled: 12.6 (Yes / No)
-0.3
Final Temp: 12.3°C.

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Sample Receipt Advice

Company name:	Cardno (WA)
Contact name:	[redacted]
Project name:	DEF19009/Stirling
Project ID:	WA_0089_PFASOMP
Turnaround time:	5 Day
Date/Time received	Jan 13, 2022 3:18 PM
Eurofins reference	855202

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 12.3 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]

Results will be delivered electronically via email to [redacted] - [redacted]

Note: A copy of these results will also be delivered to the general Cardno (WA) email address.

Global Leader - Results you can trust

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Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 855202
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 13, 2022 3:18 PM
Due: Jan 24, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC213_220111	Jan 11, 2022		Water	L22-Ja09050		X
2	0089_QC214_220111	Jan 11, 2022		Soil	L22-Ja09051	X	X
3	0089_QC215_220112	Jan 12, 2022		Water	L22-Ja09052		X
4	0089_QC216_220112	Jan 12, 2022		Water	L22-Ja09053		X
5	0089_QC217_220112	Jan 12, 2022		Soil	L22-Ja09054	X	X
6	0089_QC218_	Jan 12, 2022		Water	L22-Ja13843		X

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IANZ # 1290

Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 855202
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 13, 2022 3:18 PM
Due: Jan 24, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	220113						
7	0089_QC219_220113	Jan 12, 2022		Water	L22-Ja13844		X
Test Counts						2	7

Cardno Consulting WA
11 Harvest Terrace
West Perth
WA 6005

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **855202-S**
Project name DEF19009/Stirling
Project ID WA_0089_PFASOMP
Received Date Jan 13, 2022

Client Sample ID			**0089_QC214_220111**	**0089_QC217_220112**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L22-Ja09051**	**L22-Ja09054**
Date Sampled			**Jan 11, 2022**	**Jan 12, 2022**
Test/Reference	LOR	Unit		
% Moisture	1	%	33	27
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	85	57
13C5-PFPeA (surr.)	1	%	101	68
13C5-PFHxA (surr.)	1	%	96	69
13C4-PFHpA (surr.)	1	%	81	65
13C8-PFOA (surr.)	1	%	78	75
13C5-PFNA (surr.)	1	%	89	75
13C6-PFDA (surr.)	1	%	91	60
13C2-PFUnDA (surr.)	1	%	105	74
13C2-PFDoDA (surr.)	1	%	100	78
13C2-PFTeDA (surr.)	1	%	114	64
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10

Client Sample ID			0089_QC214_220111	0089_QC217_220112
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L22-Ja09051**	**L22-Ja09054**
Date Sampled			**Jan 11, 2022**	**Jan 12, 2022**
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
13C8-FOSA (surr.)	1	%	70	52
D3-N-MeFOSA (surr.)	1	%	113	71
D5-N-EtFOSA (surr.)	1	%	63	69
D7-N-MeFOSE (surr.)	1	%	76	57
D9-N-EtFOSE (surr.)	1	%	84	69
D5-N-EtFOSAA (surr.)	1	%	78	56
D3-N-MeFOSAA (surr.)	1	%	75	60
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	98	77
18O2-PFHxS (surr.)	1	%	92	66
13C8-PFOS (surr.)	1	%	112	76
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	29	33
13C2-6:2 FTSA (surr.)	1	%	47	40
13C2-8:2 FTSA (surr.)	1	%	56	76
13C2-10:2 FTSA (surr.)	1	%	87	69
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Brisbane	Jan 13, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jan 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jan 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jan 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jan 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Cardno (WA)
Address: 11 Harvest Terrace
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WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 855202
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 13, 2022 3:18 PM
Due: Jan 24, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC213_220111	Jan 11, 2022		Water	L22-Ja09050		X
2	0089_QC214_220111	Jan 11, 2022		Soil	L22-Ja09051	X	X
3	0089_QC215_220112	Jan 12, 2022		Water	L22-Ja09052		X
4	0089_QC216_220112	Jan 12, 2022		Water	L22-Ja09053		X
5	0089_QC217_220112	Jan 12, 2022		Soil	L22-Ja09054	X	X
6	0089_QC218_	Jan 12, 2022		Water	L22-Ja13843		X

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Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 855202
Phone: 08 9273 3888
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Received: Jan 13, 2022 3:18 PM
Due: Jan 24, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	220113						
7	0089_QC219_220113	Jan 12, 2022		Water	L22-Ja13844		X
Test Counts						2	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	99			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	94			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	94			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	107			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	97			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	125			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	107			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	93			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	91			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	137			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	91			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	118			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	97			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	113			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	98			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	109			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	82			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	77			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	113			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	87			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	89			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	104			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	104			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	80			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	104			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	116			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L22-Ja09051	CP	%	107			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja09051	CP	%	100			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja09051	CP	%	87			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja09051	CP	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja09051	CP	%	90			50-150	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja09051	CP	%	110			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja09051	CP	%	98			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja09051	CP	%	125			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja09051	CP	%	115			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja09051	CP	%	91			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja09051	CP	%	91			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L22-Ja09051	CP	%	138			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja09051	CP	%	85			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja09051	CP	%	109			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja09051	CP	%	107			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja09051	CP	%	133			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja09051	CP	%	95			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja09051	CP	%	102			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L22-Ja09051	CP	%	86			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja09051	CP	%	83			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja09051	CP	%	114			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja09051	CP	%	94			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja09051	CP	%	102			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja09051	CP	%	125			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja09051	CP	%	108			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja09051	CP	%	77			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja09051	CP	%	113			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja09051	CP	%	127			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja09051	CP	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja09051	CP	%	111			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B22-Ja09413	NCP	%	8.4	8.2	2.0	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja09054	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja09054	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja09054	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja09054	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS (QLD)

[redacted]

[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Cardno Consulting WA
11 Harvest Terrace
West Perth
WA 6005

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **855202-W**
Project name DEF19009/Stirling
Project ID WA_0089_PFASOMP
Received Date Jan 13, 2022

Client Sample ID			**0089_QC213_220111**	**0089_QC215_220112**	**0089_QC216_220112**	**0089_QC218_220113**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-Ja09050**	**L22-Ja09052**	**L22-Ja09053**	**L22-Ja13843**
Date Sampled			**Jan 11, 2022**	**Jan 12, 2022**	**Jan 12, 2022**	**Jan 12, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	0.04	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	73	76	87	108
13C5-PFPeA (surr.)	1	%	128	125	132	131
13C5-PFHxA (surr.)	1	%	77	83	85	76
13C4-PFHpA (surr.)	1	%	95	88	105	157
13C8-PFOA (surr.)	1	%	104	98	113	142
13C5-PFNA (surr.)	1	%	86	80	77	134
13C6-PFDA (surr.)	1	%	78	67	58	98
13C2-PFUnDA (surr.)	1	%	60	59	52	85
13C2-PFDoDA (surr.)	1	%	39	41	37	74
13C2-PFTeDA (surr.)	1	%	22	54	38	59
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	23	37	33	88
D3-N-MeFOSA (surr.)	1	%	70	78	68	82

Client Sample ID			0089_QC213_220111	0089_QC215_220112	0089_QC216_220112	0089_QC218_220113
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-Ja09050**	**L22-Ja09052**	**L22-Ja09053**	**L22-Ja13843**
Date Sampled			**Jan 11, 2022**	**Jan 12, 2022**	**Jan 12, 2022**	**Jan 12, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	82	117	99	85
D7-N-MeFOSE (surr.)	1	%	39	40	37	62
D9-N-EtFOSE (surr.)	1	%	46	66	54	72
D5-N-EtFOSAA (surr.)	1	%	22	INT	22	35
D3-N-MeFOSAA (surr.)	1	%	26	INT	22	38
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	[N09]0.65	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.08	[N09]0.01	0.02	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	100	101	106	116
18O2-PFHxS (surr.)	1	%	75	72	83	143
13C8-PFOS (surr.)	1	%	77	74	65	113
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	49	39	50	79
13C2-6:2 FTSA (surr.)	1	%	45	36	44	125
13C2-8:2 FTSA (surr.)	1	%	36	27	24	83
13C2-10:2 FTSA (surr.)	1	%	31	29	27	81
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.08	0.66	0.02	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.08	0.01	0.02	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.08	0.66	0.02	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.08	0.7	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	0.7	< 0.1	< 0.1

Client Sample ID			0089_QC219_220113
Sample Matrix			**Water**
Eurofins Sample No.			**L22-Ja13844**
Date Sampled			**Jan 12, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01

Client Sample ID			0089_QC219_220113
Sample Matrix			**Water**
Eurofins Sample No.			**L22-Ja13844**
Date Sampled			**Jan 12, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	114
13C5-PFPeA (surr.)	1	%	160
13C5-PFHxA (surr.)	1	%	90
13C4-PFHpA (surr.)	1	%	154
13C8-PFOA (surr.)	1	%	145
13C5-PFNA (surr.)	1	%	125
13C6-PFDA (surr.)	1	%	84
13C2-PFUnDA (surr.)	1	%	73
13C2-PFDoDA (surr.)	1	%	68
13C2-PFTeDA (surr.)	1	%	51
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	84
D3-N-MeFOSA (surr.)	1	%	72
D5-N-EtFOSA (surr.)	1	%	75
D7-N-MeFOSE (surr.)	1	%	57
D9-N-EtFOSE (surr.)	1	%	64
D5-N-EtFOSAA (surr.)	1	%	49
D3-N-MeFOSAA (surr.)	1	%	48
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	136
18O2-PFHxS (surr.)	1	%	140
13C8-PFOS (surr.)	1	%	106

Client Sample ID			0089_QC219_220113
Sample Matrix			**Water**
Eurofins Sample No.			**L22-Ja13844**
Date Sampled			**Jan 12, 2022**
Test/Reference	LOR	Unit	
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	93
13C2-6:2 FTSA (surr.)	1	%	166
13C2-8:2 FTSA (surr.)	1	%	75
13C2-10:2 FTSA (surr.)	1	%	69
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jan 18, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jan 18, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jan 18, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jan 18, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730
Report #: 855202
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 13, 2022 3:18 PM
Due: Jan 24, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC213_220111	Jan 11, 2022		Water	L22-Ja09050		X
2	0089_QC214_220111	Jan 11, 2022		Soil	L22-Ja09051	X	X
3	0089_QC215_220112	Jan 12, 2022		Water	L22-Ja09052		X
4	0089_QC216_220112	Jan 12, 2022		Water	L22-Ja09053		X
5	0089_QC217_220112	Jan 12, 2022		Soil	L22-Ja09054	X	X
6	0089_QC218_	Jan 12, 2022		Water	L22-Ja13843		X

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Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
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Order No.: DEF19009/730
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Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Jan 13, 2022 3:18 PM
Due: Jan 24, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	220113						
7	0089_QC219_220113	Jan 12, 2022		Water	L22-Ja13844		X
Test Counts						2	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	126			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	129			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	104			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	114			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	104			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	127			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	108			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	139			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	126			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	120			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	118			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	145			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	108			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	122			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	96			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	110			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	114			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	127			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	100			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	89			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	124			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	106			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	121			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	135			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	121			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	89			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	131			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	125			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	116			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	122			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L22-Ja13844	CP	%	147			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja13844	CP	%	137			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja13844	CP	%	132			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja13844	CP	%	141			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja13844	CP	%	147			50-150	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja13844	CP	%	143			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja13844	CP	%	137			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja13844	CP	%	140			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja13844	CP	%	145			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja13844	CP	%	147			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja13844	CP	%	87			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L22-Ja13844	CP	%	117			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja13844	CP	%	122			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja13844	CP	%	141			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja13844	CP	%	141			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja13844	CP	%	138			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja13844	CP	%	136			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja13844	CP	%	138			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L22-Ja13844	CP	%	126			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja13844	CP	%	119			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja13844	CP	%	145			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja13844	CP	%	144			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja13844	CP	%	137			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja13844	CP	%	129			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja13844	CP	%	149			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja13844	CP	%	114			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja13844	CP	%	136			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja13844	CP	%	127			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja13844	CP	%	139			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja13844	CP	%	118			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ja09050	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ja09050	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja09050	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja09050	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja09050	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja09050	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja09050	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja09050	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja09050	CP	ug/L	0.08	0.08	2.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja09050	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja09050	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ja13843	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ja13843	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja13843	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja13843	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja13843	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja13843	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja13843	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja13843	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja13843	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja13843	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ja13844	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ja13844	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ja13844	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ja13844	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ja13844	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ja13844	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ja13844	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ja13844	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ja13844	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ja13844	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS (QLD)

[redacted]

[redacted]

Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Monitoring Date	Specific Site	Monitoring Location	Sample ID	Screen Interval (mbgl)	TOC (mAHD)	Well Depth (m)	SWL Time	SWL (mbTOC)	RWL (mAHD)	Observations on Bore/Site	Sampling Method	Temp (Co)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour Comments	Colour	R2 Temp (C0)	R2 DO (mg/L)	R2 EC (us/Cm)	R2 TDS (mg/L)2	R2 pH	R2 Eh (mV)	R3 Temp (C0)	R3 DO (mg/L)	R3 EC (us/Cm)	R3 TDS (mg/L)	R3 pH	R3 Eh (mV)
11/01/2022	Stirling/Unknown	MW010	0089_MW010_220111	NA	4.859	9.2	13:34:00	3.9	0.959	Hydrocarbon odour	Hydrasleeve	25.2	1.79	1413	916.5	7.56	68.8		Hydrocarbon	Clear												
10/01/2022	Stirling/Fire Training Area	MW109		2.5-5.5_	4.446	5.5	9:57:00			Dry	Hydrasleeve																					
10/01/2022	Stirling/Fire Training Area	MW112	0089_MW112_220110	3.0 - 6.0	3.973	6	9:49:00	3.5	0.473		Hydrasleeve	21.2	1.23	562	364	7.55	134.7			Cloudy												
10/01/2022	Stirling/Fire Training Area	MW120	0089_MW120_220110	2.5-5.5_	4.409	5.5	9:27:00	3.34	1.069		Hydrasleeve	21	1.9	644	416	7.58	140.4	104/204		Clear												
10/01/2022	Stirling/Fire Training Area	MW121	0089_MW121_220110	2.7-5.7_	3.7	5.7	9:08:00	3.36	0.34		Hydrasleeve	20.8	5.16	505.5	328.9	7.87	135.7			Cloudy,Clear												
10/01/2022	Stirling/Fire Training Area	MW123	0089_MW123_220110	4.5-8_	6.62	8	8:43:00	6.27	0.35	QC 101/201	Hydrasleeve	20.9	1.27	858	559	7.34	171.7	101/201		Clear												
10/01/2022	Stirling/Fire Training Area	MW124	0089_MW124_220110	0.75-4_	1.899	4	8:50:00	1.94	-0.041		Hydrasleeve	19.9	0.4	35739	25730	7.5	-303.8		Sulfidic	Clear												
10/01/2022	Stirling/Fire Training Area	MW125	0089_MW125_220110	0.9-3.9_	1.882	3.9	10:05:00	1.9	-0.018		Hydrasleeve	20.7	0.38	36979	26191	7.25	-266.6		Slight sulfidic	Clear												
10/01/2022	Stirling/Fire Training Area	MW126	0089_MW126_220110	0.9-3.9_	1.948	3.9	8:40:00	1.9	0.048	Slight sulfur odour	Hydrasleeve	20.5	0.91	43258	28119	6.95	-297.2		Sulfur	Clear												
10/01/2022	Stirling/Fire Training Area	MW127	0089_MW127_220110	0.9-3.9_	1.771	3.9	9:28:00	1.81	-0.039	Slight sulfur odour	Hydrasleeve	22	0.55	39757	25844	7.13	-275.9		Sulfur	Clear												
10/01/2022	Stirling/Fire Training Area	MW128		2.5-5.5_	4.537	5.5	8:22:00			Dry	Hydrasleeve																					
10/01/2022	Stirling/Demolition Ground	MW137		0.9-3.9_	2.058	3.9	12:35:00			Not found	Hydrasleeve																					
10/01/2022	Stirling/Demolition Ground	MW139	0089_MW139_220110	2-5_	2.273	5	14:24:00	2.1	0.173		Hydrasleeve	22.1	2.27	1484	955.5	8.26	-7			Clear												
10/01/2022	Stirling/Demolition Ground	MW141	0089_MW141_220110	2-5_	3.025	5	13:36:00	2.89	0.135	QC 112/212	Hydrasleeve	20.7	1.04	22349	14527	7.25	-177.6	112/212		Cloudy												
10/01/2022	Stirling/Demolition Ground	MW142	0089_MW142_220110	0.25-4_	2.573	4	14:01:00	2.49	0.083		Hydrasleeve	20.7	2.2	28910	18804	7.24	-75.6			Cloudy												
10/01/2022	Stirling/Demolition Ground	MW147		2.0-5.0_	3.423	5	13:24:00			Dry, difficult to access due to vegetation overgrown	Hydrasleeve																					
10/01/2022	Stirling/Demolition Ground	MW149	0089_MW149_220110	1-4_	2.303	4	13:53:00	2.21	0.093		Hydrasleeve	20.2	1.71	41460	26949	7.65	-41.9			Clear												
10/01/2022	Stirling/Waste Water Treatment Plant	MW158		NA	14.541	15.82	11:27:00			Dry unable to sample	Hydrasleeve																					
10/01/2022	Stirling/Waste Water Treatment Plant	MW161	0089_MW161_220110	NA	17.225	18.13	11:36:00	16.78	0.445		Hydrasleeve	21.3	2.82	3518	2458	7.53	-64.6			Cloudy,Brown												
10/01/2022	Stirling/Waste Water Treatment Plant	MW166	0089_MW166_220110	10-13_	11.89	13	11:42:00	11.33	0.56		Hydrasleeve	21.5	2.13	3798	2470	7.37	-84.1			Clear no odour												
10/01/2022	Stirling/Waste Water Treatment Plant	MW171	0089_MW171_220110	28.5-31.5_	29.238	31.5	12:34:00	28.64	0.598		Hydrasleeve	20.9	0.88	13570	9563	7.31	67			Brown												
10/01/2022	Stirling/Waste Water Treatment Plant	MW172		NA	16.772	26	12:24:00			Dry	Hydrasleeve																					
10/01/2022	Stirling/Waste Water Treatment Plant	MW173		NA	10.08	11.11	11:22:00			Dry	Hydrasleeve																					
10/01/2022	Stirling/Waste Water Treatment Plant	MW193	0089_MW193_220110	10.5-13.5_	11.86	13.5	11:00:00	11.289	0.571	Grey slight odour and quite turbid	Hydrasleeve	22.7	1.08	3540	2301	7.2	-132.8		Slight odour	Cloudy grey												
10/01/2022	Stirling/Waste Water Treatment Plant	MW195D	0089_MW195D_220110	10-13_	4.363	13	10:55:00	4.26	0.103		Hydrasleeve	21.9	0.96	31589	21821	7.53	-134.9			Clear												
10/01/2022	Stirling/Waste Water Treatment Plant	MW195S	0089_MW195S_220110	3.5-6.5_	4.571	6.5	10:53:00	4.21	0.361		Hydrasleeve	22.6	1.66	4745	3233	7.37	1.9	QC106/QC206		Clear												
10/01/2022	Stirling/Waste Water Treatment Plant	MW197		NA	2.28	NA	12:55:00			Dry	Hydrasleeve																					
10/01/2022	Stirling/Waste Water Treatment Plant	MW199	0089_MW199_220110	NA	11.8	NA	10:30:00	11.43	0.37		Hydrasleeve	22.5	2.28	14294	9760	7.48	-120.4			Clear												
10/01/2022	Stirling/Waste Water Treatment Plant	MW200	0089_MW200_220110	NA	2.07	NA	13:18:00	2.06	0.01		Hydrasleeve	22.5	2.32	7646	5213	7.79	-34.7			Clear												
12/01/2022	Stirling/Waste Water Treatment Plant	MW202	0089_MW202_220112	NA	2.12	NA	10:28:00	1.87	0.25	Hand bailed hydrasleeve broke upon retrieval.	HandBailing	23.3	1.53	1374	890.5	7.47	45.3			Clear	23.4	1.56	1378	901.1	7.49	-30.6	23.4	1.54	1375	895.6	7.48	-36.8
10/01/2022	Stirling/Waste Water Treatment Plant	MW203	0089_MW203_220110	NA	10.855	12.9	14:13:00	10.52	0.335		Hydrasleeve	21.9	1.51	2421	1672	7.68	-76.5			Clear												
13/01/2022	Stirling/Helicopter Support Facility	MW214	0089_MW214_220113	5.5-9_	8.075	9	10:39:00	8.14	-0.065		HydroSleeve	23.4	3.42	1842	1234	7.31	-45.1			Cloudy												
13/01/2022	Stirling/Helicopter Support Facility	MW215	0089_MW215_220113	1.5-4.5_	3.794	4.5	11:01:00	3.57	0.224		HydroSleeve	21.1	1.11	1482	1040	7.32	0.1		Slight sulfidic	Cloudy,Black												
13/01/2022	Stirling/Helicopter Support Facility	MW216	0089_MW216_220113	6-9_	8.329	6	10:53:00	7.98	0.349		HydroSleeve	21.8	2.3	1948	1347	7.42	5.18			Cloudy												
13/01/2022	Stirling/Helicopter Support Facility	MW217	0089_MW217_220113	6.5-9.5_	8.847	9.5	8:48:00	8.455	0.392	Cloudy no odour	Hydrasleeve	21.5	2.16	1005	656.5	7	105.8			Cloudy												
13/01/2022	Stirling/Helicopter Support Facility	MW220	0089_MW220_220113	NA	NA	NA	9:12:00	6.7		Lots of roots present. Organic smell.	Hydrasleeve	20.2	2.69	993	643.5	7.34	87.1		Organic	Brown												
13/01/2022	Stirling/Helicopter Support Facility	MW224	0089_MW224_220113	11.25-14.25_	13.372	14.25	9:34:00	12.99	0.382		Hydrasleeve	20.9	3.71	900	585	7.64	85.9	QC118/218		Clear												
13/01/2022	Stirling/Helicopter Support Facility	MW225	0089_MW225_220113	2-5_	4.066	5	11:32:00	3.91	0.156		HydroSleeve	21.1	1.56	2446	1716	7.29	-232.8			Cloudy												
13/01/2022	Stirling/Helicopter Support Facility	MW226	0089_MW226_220113	0.75-3.8_	1.749	3.8	13:48:00	1.72	0.029		HydroSleeve	23.7	0.73	42323	27606	7.23	-195.6			Brown												
14/01/2022	Stirling/Helicopter Support Facility	MW227	0089_MW227_220114	1.25-4.2_	2.961	4.2	9:57:00	2.88	0.081		Hydrasleeve	21.5	0.73	5867	4054	7.59	-62.4			Clear												
14/01/2022	Stirling/Helicopter Support Facility	MW228	0089_MW228_220114	0.75-3.75_	2.23	3.75	9:17:00	2.17	0.06		Hydrasleeve	22.2	0.31	19836	13629	7.28	-243.4			Clear												
10/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW233	0089_MW233_220110	NA	3.705	4.968	14:31:00	3.33	0.375		Hydrasleeve	20.6	3.59	483.6	343	8.51	-73.1			Clear												
10/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW236	0089_MW236_220110	NA	4.642	5.66	12:49:00	4.104	0.538	Hydrasleeve broke upon retrieval.	HandBailing	23.6	2.94	816	533	7.66	49.9			Brown												
12/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW238	0089_MW238_220112	NA	4.827	NA	9:18:00	4.412	0.415	Clear no odour	Hydrasleeve	21.8	2.28	725	474.5	7.64	108.5			Clear												
12/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW239	0089_MW239_220112	NA	4.03	NA	9:28:00	3.634	0.396	Clear slight diesel odour	Hydrasleeve	21.2	4.52	476.1	309.4	7.75	105.6		Diesel	Clear												
12/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW240	0089_MW240_220112	NA	4.483	6.8	8:45:00	4.068	0.415		Hydrasleeve	23	2.07	863	559	7.41	99.9	QC115/215		Clear												
12/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW242	0089_MW242_220112	NA	3.539	4.76	12:37:00	3.17	0.369		Hydrasleeve	25.3	0.87	1508	981.5	8.01	-105.4			Clear												
12/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW243	0089_MW243_220112	NA	4.892	7	8:41:00	4.499	0.393		Hydrasleeve	22.3	2.06	1026	669.5	7.1	109.5		Slight hydrocarbon	Clear												
12/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW245	0089_MW245_220112	NA	4.551	5.65	9:49:00	4.18	0.371		Hydrasleeve	21.2	1.81	754	487.5	7.26	-47.7		Strong fuel/diesel odo	Clear												
12/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW248	0089_MW248_220112	NA	4.073	NA	13:18:00	3.92	0.153	Slight fuel odour	Hydrasleeve	23.5	2.46	2194	1423.5	7.32	-107.1		Hydrocarbon Odour	Cloudy												
12/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW249	0089_MW249_220112	3.5-6.5_	5.227	6.5	13:02:00	4.95	0.277	No odour. Clayey orange in colour	Hydrasleeve	25.2	2.09	1256	819	7.43	-24.2			Orange												
10/01/2022	Stirling/Fire Station, Flammable/Hazardous Gc	MW255	0089_MW255_220110	3-6_	4.609	6	13:33:00	4.15	0.459	Clear no odour	Hydrasleeve	22	0.84	786	513.5	7.62	70.4			Clear												
10/01/2022	Stirling/Fire Station, Flammable/Hazardous Gc	MW256	0089_MW256_220110	3-6_	3.84	6	13:22:00	3.36	0.48		Hydrasleeve	22.2	0.83	1610	1046.5	7.03	49.9	QC110/210		Clear												
10/01/2022	Stirling/Fire Station, Flammable/Hazardous Gc	MW257	0089_MW257_220110	2.7-5.7_	3.806	5.7	14:14:00	3.35	0.456		Hydrasleeve	21.4	4.81	565	364	7.81	74.3			Clear												
10/01/2022	Stirling/Fire Station, Flammable/Hazardous Gc	MW258		3.0-6.0_	4.043	6	14:41:00			Dry	Hydrasleeve																					
11/01/2022	Stirling/Fire Station, Flammable/Hazardous Gc	MW259	0089_MW259_220111	2.5-5.5_	3.8	5.5	12:01:00	3.375	0.425	No odour, clear. Lots of roots	Hydrasleeve	22.8	2.31	1503	975	7.76	44.3			Clear												
11/01/2022	Stirling/Fire Station, Flammable/Hazardous Gc	MW261	0089_MW261_220111	3-6_	3.858	6	13:49:00	3.6	0.258	Hydrocarbon odour. Well covered in mulch	Hydrasleeve	26.1	1.75	1636	1066	7.51	-216		Hydrocarbon	Clear												
13/01/2022	Stirling/Dredge Spoil / Careening Bay	MW264	0089_MW264_220113				9:28:00			Unable to sample as well destroyed.																					
11/01/2022	Stirling/Dredge Spoil / Careening Bay	MW268	0089_MW268_220111	2.5-5.5_	4.056	5.5	12:52:00	3.905	0.151		Hydrasleeve	23.6	1.49	4495	2918.5	7.27	65.3			Clear												
11/01/2022	Stirling/Dredge Spoil / Careening Bay	MW269	0089_MW269_220111	2.5-5.5_	4.153	5.5	13:06:00	3.985	0.168		Hydrasleeve	24.2	1.39	1738	1131	7.35	54.1			Clear												
10/01/2022	Stirling/Demolition Ground	MW272		0.9-3.9_	2.226	3.9	12:22:00			Bore not found	Hydrasleeve									Clear												
13/01/2022	Stirling/Helicopter Support Facility	MW282	0089_MW282_220113	4.5-7.5_	5.78	7.5	9:51:00	5.355	0.425	Very orange slight organic odour	Hydrasleeve	21.3	2.42	1056	689	7.03	84.1		Organic	Orange												
12/01/2022	Stirling/Accommodation Area	MW288	0089_MW288_220112	2.25-5.25_	4.003	5.25	11:18:00	3.81	0.193		Hydrasleeve	26.2	1.28	885	578.5	7.56	38.8			Clear												
13/01/2022	Stirling/Accommodation Area	MW289	0089_MW289_220113	3.25-6.25	4.495	6.25	10:06:00	4.15	0.345		HydroSleeve	22.2	1.18	1231	845	7.32	82.5			Clear												
10/01/2022	Stirling/Fire Training Area	MW500	0089_MW117_220110	2.0-6.5_	3.692	6.5	10:11:00	3.38	0.312	Bore lid Labelled MW500, MW117 not found	Hydrasleeve	23.1	1.3	332.6	215.15	7.44	-27.3	105/205		Clear												
12/01/2022	Stirling/AVCAT Storage and Fuel Farm	MW516	0089_MW516_220112	4.5-7.5_	6.37	7.5	13:34:00	6.139	0.231	Clear slight fuel odour	Hydrasleeve	23.8	1.27	1879	1222	7.26	-9.4		Hydrocarbon	Clear												
10/01/2022	Stirling/Fire Station, Flammable/Hazardous Gc	MW517	0089_MW517_220110	3-6_	4.77	6	13:54:00	4.275	0.495		Hydrasleeve	22	1.01	702	455	7.42	70.2			Clear												
11/01/2022	Stirling/Fire Station, Flammable/Hazardous Gc	MW518	0089_MW518_220111	3.5-6.5_	5.55	6.5	12:12:00	5.27	0.28		Hydrasleeve	22.9	1.24	2214	1436.5	7.38	74.3			Clear												

Table D2 - Porewater Field Records

PFAS OMP Q4 2021 sampling event
HMAS Stirling

Monitoring Date	Specific Site	Monitoring Location	Sample_ID	Observations	Sampling Method	Temp (Co)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour	Colour
11/01/2022	Stirling/Waste Water Treatment Plant East	PW304	0089_PW304_220111		peristaltic pump	25.8	0.5	60090	38364	7.43	-299.4		Slight Sulfuric	Clear
13/01/2022	Stirling/Helicopter Support Facility	PW306	0089_PW306_220113		peristaltic pump	25.9	0.97	55478	36075	7.74	44.3		no	Clear
13/01/2022	Stirling/Helicopter Support Facility	PW307	0089_PW307_220113		peristaltic pump	25.3	1.09	56400	36650	7.91	57		no	Clear
13/01/2022	Stirling/Helicopter Support Facility	PW308	0089_PW308_220113		peristaltic pump	26.2	1.08	56087	36465	8.04	55.4		no	Clear
13/01/2022	Stirling/Helicopter Support Facility	PW314	0089_PW314_220113		peristaltic pump	24.7	0.92	56016	36400	7.8	47.1		no	Clear
13/01/2022	Stirling/Helicopter Support Facility	PW315	0089_PW315_220113		peristaltic pump	25.5	1.31	56137	36465	7.94	59.9	QC119/219	no	Clear
13/01/2022	Stirling/Helicopter Support Facility	PW316	0089_PW316_220113		peristaltic pump	24.5	1.33	55679	36205	8	60.7		no	Clear,Cloudy
10/01/2022	Stirling/Demolition Ground	PW329	0089_PW329_220110		peristaltic pump	24.9	0.11	63330	41145	7.45	-280.4	QC108/208	no	Clear
10/01/2022	Stirling/Demolition Ground	PW330	0089_PW330_220110		peristaltic pump	23.5	0.8	62077	40365	7.64	-155.5		no	Clear
10/01/2022	Stirling/Demolition Ground	PW331	0089_PW331_220110		peristaltic pump	23.3	0.48	60610	39390	7.61	-151.7		no	Clear
10/01/2022	Stirling/Fire Training Area	PW335	0089_PW335_220110		peristaltic pump	22	1.48	52616	36286	7.82	-159.6		no	Clear
10/01/2022	Stirling/Fire Training Area	PW340	0089_PW340_220110		peristaltic pump	22.5	1.47	52319	35722	7.87	192.5		no	Clear
10/01/2022	Stirling/Fire Training Area	PW341	0089_PW341_220110		peristaltic pump	22.3	0.55	56536	36725	7.81	-199.4		no	Clear
10/01/2022	Stirling/Waste Water Treatment Plant East	PW345	0089_PW345_220110		peristaltic pump	24.7	0.31	58841	38464	7.08	-328.9	QC111,QC211	Slight Sulfuric	Clear,Brown
12/01/2022	Stirling/Waste Water Treatment Plant East	PW346	0089_PW346_220112		peristaltic pump	25.1	0.63	50919	33085	7.46	-272.4		Slight organic	Clear
11/01/2022	Stirling/Waste Water Treatment Plant West	PW350	0089_PW350_220111		peristaltic pump	25.2	3.21	55250	35945	7.89	64.6		no	Clear
11/01/2022	Stirling/Waste Water Treatment Plant West	PW351	0089_PW351_220111		peristaltic pump	23.7	2.74	55615	36075	8.04	57.8		no	Clear
11/01/2022	Stirling/Waste Water Treatment Plant West	PW352	0089_PW352_220111		peristaltic pump	23.2	2.4	56068	36465	8.08	50.5		no	Clear
10/01/2022	Stirling/Demolition Ground	PW356	0089_PW356_220110		peristaltic pump	23.5	0.82	61565	40040	7.57	-134.7		no	Clear
10/01/2022	Stirling/Demolition Ground	PW357	0089_PW357_220110		peristaltic pump	23.5	0.71	60931	39585	7.62	-131.1		no	Clear
10/01/2022	Stirling/Demolition Ground	PW358	0089_PW358_220110		peristaltic pump	24.1	0.55	62130	40365	7.68	-211.7		no	Clear
10/01/2022	Stirling/Fire Training Area	PW362	0089_PW362_220110		peristaltic pump	22.7	1.05	58489	38025	7.67	-199.2		no	Clear
10/01/2022	Stirling/Fire Training Area	PW363	0089_PW363_220110		peristaltic pump	21.5	0.77	56876	36985	7.77	-200.2		no	Clear
10/01/2022	Stirling/Fire Training Area	PW364	0089_PW364_220110		peristaltic pump	22.4	1.2	52437	35898	7.8	-179.4		no	Clear
11/01/2022	Stirling/Waste Water Treatment Plant East	PW367	0089_PW367_220111		peristaltic pump	26.8	0.19	60793	38167	7.02	-370.8	QC113, QC213	Slight Sulfuric	Clear
11/01/2022	Stirling/Waste Water Treatment Plant East	PW368	0089_PW368_220111		peristaltic pump	24.6	1.02	28474	18653	7.75	-146.6		Slight Sulfuric	Clear
10/01/2022	Stirling/Waste Water Treatment Plant East	PW369	0089_PW369_220110		peristaltic pump	24.3	1.13	57939	38170	7.49	-215		no	Brown,Clear
13/01/2022	Stirling/Dredge Spoil / Careening Bay	PW374	0089_PW374_220113		peristaltic pump	24.8	1.29	55449	36010	7.96	71.2		no	Clear
13/01/2022	Stirling/Dredge Spoil / Careening Bay	PW375	0089_PW375_220113		peristaltic pump	24.6	1.58	52821	34320	7.95	65.7		no	Clear
13/01/2022	Stirling/Dredge Spoil / Careening Bay	PW378	0089_PW378_220113		peristaltic pump	26.2	1.95	55543	36140	7.83	79.9		no	Clear
11/01/2022	Stirling/Waste Water Treatment Plant West	PW380	0089_PW380_220111		peristaltic pump	24.8	2.77	56023	36465	8.01	60.6		no	Clear
11/01/2022	Stirling/Waste Water Treatment Plant West	PW381	0089_PW381_220111		peristaltic pump	23.1	3.33	56267	36595	8.09	55.5		no	Clear
11/01/2022	Stirling/Waste Water Treatment Plant West	PW401	0089_PW401_220111		peristaltic pump	23.9	2.43	56084	36465	7.99	59.5		no	Clear
14/01/2022	Stirling/Helicopter Support Facility	PW405	0089_PW405_220114		peristaltic pump	24.9	0.65	55012	35800	7.77	-158		no	Clear
14/01/2022	Stirling/Helicopter Support Facility	PW407	0089_PW407_220114		peristaltic pump	24.9	0.78	55551	35747	7.73	-25.5		no	Clear
14/01/2022	Stirling/Helicopter Support Facility	PW409	0089_PW409_220114		peristaltic pump	25.2	0.7	56703	35690	7.82	-78.1		no	Clear
14/01/2022	Stirling/Helicopter Support Facility	PW411	0089_PW411_220114		peristaltic pump	24.9	1.49	55690	35581	7.85	38.4		no	Clear
14/01/2022	Stirling/Helicopter Support Facility	PW413	0089_PW413_220114		peristaltic pump	25	1.9	58987	36928	7.86	38.3		no	Clear
14/01/2022	Stirling/Helicopter Support Facility	PW415	0089_PW415_220114		peristaltic pump	25.2	1.64	57414	35833	7.94	31.7		no	Clear

24.33846154

Site	Monitoring Location	Date	Sample ID	Time	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	Flow Rate	Comments	Temp °C	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Water Colour	Turbidity
Stirling/Fire Training Area	SW130	10/01/2022	0089_SW130_220110	13:11	Direct_into_Bottle	0.2	0.8	Fast		19.8	4.43	48660	35091	8.22	-8.3	Clear	Low
Stirling/Fire Training Area	SW132	10/01/2022	0089_SW132_220110	13:23	Direct_into_Bottle	0.1	0.9	Slow		21.4	5.13	50570	35277	8.26	-16.6	Clear	Low
Stirling/Fire Training Area	SW134	10/01/2022	0089_SW134_220110	13:27	Direct_into_Bottle	0.1	0.2	Slow	QC102/202	20.7	3.36	55557	36140	8.07	-119.6	Clear	Medium
Stirling/Demolition Ground	SW150	10/01/2022	0089_SW150_220110	11:45	Direct_into_Bottle	0.1	1	Fast		24.8	4.04	54736	356620	8.14	131	Clear	Low
Stirling/Demolition Ground	SW152	10/01/2022	0089_SW152_220110	11:17	Direct_into_Bottle	0.1	1	Fast		24.5	4.11	55303	35945	8.25	124.8	Clear	Low
Stirling/Demolition Ground	SW154	10/01/2022	0089_SW154_220110	10:23	Direct_into_Bottle	0.1	1	Fast		24.8	4.14	55198	35880	8.26	123.4	Clear	Low
Stirling/Demolition Ground	SW156	10/01/2022	0089_SW156_220110	09:26	Direct_into_Bottle	0.1	1	Medium	QC107/207	25.1	3.8	55276	35945	8.26	124.3	Clear	Low
Stirling/Waste Water Treatment Plant East	SW305	11/01/2022	0089_SW305_220111	12:26	Direct_into_Bottle	0.1	0.7	Medium		25.3	4.28	58620	35274	8.15	-64.6	Clear	Low
Stirling/Helicopter Support Facility	SW309	13/01/2022	0089_SW309_220113	14:03	Direct_into_Bottle	0.2	0.5	Slow		23.6	4.09	55170	35328	8.31	17.6	Clear	Low
Stirling/Helicopter Support Facility	SW310	13/01/2022	0089_SW310_220113	13:30	Direct_into_Bottle	0.2	0.6	Slow		23.7	3.62	55167	35358	8.25	31.1	Clear	Low
Stirling/Helicopter Support Facility	SW311	13/01/2022	0089_SW311_220113	13:10	Direct_into_Bottle	0.2	0.5	Slow		23.4	4.69	54300	35036	8.28	5.7	Clear	Low
Stirling/Dredge Spoil / Careening Bay	SW317	13/01/2022	0089_SW317_220113	15:18	Direct_into_Bottle	0.1	0.3	Slow		25.3	3.29	54634	35490	8.11	89	Clear	Low
Stirling/Dredge Spoil / Careening Bay	SW318	13/01/2022	0089_SW318_220113	15:44	Direct_into_Bottle	0.2	0.4	Fast		25.2	1.54	55490	36075	8.19	64.3	Clear	Medium
Stirling/Dredge Spoil / Careening Bay	SW319	13/01/2022	0089_SW319_220113	15:59	Direct_into_Bottle	0.2	0.4	Fast	sample incorrectly labelled SW314	24.6	1.62	55633	36140	8.22	63.7	Clear	Low
Stirling/Waste Water Treatment Plant West	SW353	11/01/2022	0089_SW353_220111	15:41	Direct_into_Bottle	0.2	0.5	Slow		24.1	4.64	52996	35018	8.17	33.7	Clear	Low
Stirling/Waste Water Treatment Plant East	SW370	10/01/2022	0089_SW370_220110	11:55	Direct_into_Bottle	0.2	0.5	Slow		25.8	4.43	55153	35305	8.14	-134.4	Clear	Low
Stirling/Waste Water Treatment Plant East	SW371	11/01/2022	0089_SW371_220111	11:49	Direct_into_Bottle	0.2	0.6	Slow	sample incorrectly labelled SW321	28.2	3.63	57733	35372	8.12	-142.1	Clear	Low
Stirling/Waste Water Treatment Plant East	SW372	12/01/2022	0089_SW372_220112	12:03	Direct_into_Bottle	0.1	0.5	Fast	QC116/216.	33.8	3.17	54644	35555	8.09	-6.8	Clear	Low
Stirling/Waste Water Treatment Plant East	SW373	12/01/2022	0089_SW373_220112	11:45	Direct_into_Bottle	0.1	0.6	Fast		27.8	4.7	55809	36270	8.25	14	Clear	Low
Stirling/Waste Water Treatment Plant West	SW382	11/01/2022	0089_SW382_220111	15:53	Direct_into_Bottle	0.1	0.4	Fast		24.6	3.82	54142	35441	8.25	42.8	Clear	Low
Stirling/Waste Water Treatment Plant West	SW383	11/01/2022	0089_SW383_220111	15:47	Direct_into_Bottle	0.1	0.5	Fast		24.5	3.87	54062	35479	8.26	65.8	Clear	Low
Stirling/Waste Water Treatment Plant West	SW384	11/01/2022	0089_SW384_220111	15:45	Direct_into_Bottle	0.1	0.8	Fast		23.9	382	53042	35207	8.24	59.1	Clear	High
Stirling/Helicopter Support Facility	SW406	14/01/2022	0089_SW406_220114	14:22	Direct_into_Bottle	0.1	0.6	Fast		25.2	4.05	55317	35160	8.03	-57.6	Clear	Low
Stirling/Helicopter Support Facility	SW408	14/01/2022	0089_SW408_220114	14:01	Direct_into_Bottle	0.1	0.6	Fast		24.9	3.43	53794	34608	8.11	35	Clear	Low
Stirling/Helicopter Support Facility	SW410	14/01/2022	0089_SW410_220114	14:15	Direct_into_Bottle	0.1	0.5	Medium		25	4.2	56090	35436	8.17	12.6	Clear	Low
Stirling/Helicopter Support Facility	SW412	14/01/2022	0089_SW412_220114	14:24	Direct_into_Bottle	0.1	0.5	Slow		25.2	3.76	56660	35740	8.3	27.9	Clear	Low
Stirling/Helicopter Support Facility	SW414	14/01/2022	0089_SW414_220114	14:45	Direct_into_Bottle	0.1	0.4	Fast		25.6	3.88	57522	35611	8.32	44.3	Clear	Low
Stirling/Helicopter Support Facility	SW416	14/01/2022	0089_SW416_220114	14:55	Direct_into_Bottle	0.1	0.5	Medium		25.2	3.96	57135	35615	8.34	25.7	Clear	Low

54943.32143

Site	Monitoring Location	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	Other Comments
Stirling/Waste Water Treatment Plant East	SD304	11/01/2022	0089_SD304_220111	0.4	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, Pale grey sandy with seaweed frag, slight odour	
Stirling/Helicopter Support Facility	SD306	13/01/2022	0089_SD306_220113	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour	QC115/215
Stirling/Helicopter Support Facility	SD307	13/01/2022	0089_SD307_220113	0.9	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour	
Stirling/Helicopter Support Facility	SD308	13/01/2022	0089_SD308_220113	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	No odour Sandy	
Stirling/Helicopter Support Facility	SD314	13/01/2022	0089_SD314_220113	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy	
Stirling/Helicopter Support Facility	SD315	13/01/2022	0089_SD315_220113	1	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour	
Stirling/Helicopter Support Facility	SD316	13/01/2022	0089_SD316_220113	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour	
Stirling/Demolition Ground	SD329	10/01/2022	0089_SD329_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand	
Stirling/Demolition Ground	SD330	10/01/2022	0089_SD330_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand	
Stirling/Demolition Ground	SD331	10/01/2022	0089_SD331_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand	
Stirling/Fire Training Area	SD335	10/01/2022	0089_SD335_220110	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, Sandy, no odour	
Stirling/Fire Training Area	SD340	10/01/2022	0089_SD340_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, sandy, no odour	QC107/207
Stirling/Fire Training Area	SD341	10/01/2022	0089_SD341_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet		
Stirling/Waste Water Treatment Plant East	SD345	10/01/2022	0089_SD345_220110	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Brown,grey sandy with seaweed fragments, slight sulfidic odour	
Stirling/Waste Water Treatment Plant East	SD346	12/01/2022	0089_SD346_220112	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy slight organic odour.	QC105/205
Stirling/Waste Water Treatment Plant West	SD350	11/01/2022	0089_SD350_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour	
Stirling/Waste Water Treatment Plant West	SD351	11/01/2022	0089_SD351_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour	
Stirling/Waste Water Treatment Plant West	SD352	11/01/2022	0089_SD352_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour	
Stirling/Demolition Ground	SD356	10/01/2022	0089_SD356_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand	QC109/209
Stirling/Demolition Ground	SD357	10/01/2022	0089_SD357_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand	
Stirling/Demolition Ground	SD358	10/01/2022	0089_SD358_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand	
Stirling/Fire Training Area	SD362	10/01/2022	0089_SD362_220110	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	No odour	
Stirling/Fire Training Area	SD363	10/01/2022	0089_SD363_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour	
Stirling/Fire Training Area	SD364	10/01/2022	0089_SD364_220110	0.4	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, sandy, no odour	
Stirling/Waste Water Treatment Plant East	SD367	11/01/2022	0089_SD367_220111	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, grey, sandy with seaweed fragments, slight sulfidic odour	
Stirling/Waste Water Treatment Plant East	SD368	11/01/2022	0089_SD368_220111	0.4	Direct_into_Bottle,Shovel_Trowel	Wet	Pale brown, sandy with seaweed fragments, slight sulfidic odour	
Stirling/Waste Water Treatment Plant East	SD369	10/01/2022	0089_SD369_220110	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy with seaweed frag, no odour	
Stirling/Dredge Spoil / Careening Bay	SD374	13/01/2022	0089_SD374_220113	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour Sandy	
Stirling/Dredge Spoil / Careening Bay	SD375	13/01/2022	0089_SD375_220113	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour	
Stirling/Dredge Spoil / Careening Bay	SD378	13/01/2022	0089_SD378_220113	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour	
Stirling/Waste Water Treatment Plant West	SD380	11/01/2022	0089_SD380_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour	
Stirling/Waste Water Treatment Plant West	SD381	11/01/2022	0089_SD381_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour	
Stirling/Waste Water Treatment Plant West	SD401	11/01/2022	0089_SD401_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour	
Stirling/Helicopter Support Facility	SD405	14/01/2022	0089_SD405_220114	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, sandy, no odour	
Stirling/Helicopter Support Facility	SD407	14/01/2022	0089_SD407_220114	1	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour	
Stirling/Helicopter Support Facility	SD409	14/01/2022	0089_SD409_220114	0.9	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour	
Stirling/Helicopter Support Facility	SD411	14/01/2022	0089_SD411_220114	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour	
Stirling/Helicopter Support Facility	SD413	14/01/2022	0089_SD413_220114	0.9	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, sandy, no odour	
Stirling/Helicopter Support Facility	SD415	14/01/2022	0089_SD415_220114	0.7	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour	

Stirling January 22 Bump Test Records

Date	Standard	Units	Acceptable Range	YSI Serial No.	
				21G105325	20K104050
11/01/2022	EC 1,413	mS/cm	5%	1,461	1,540
	pH4	pH units	3.9 - 4.1	4.02	4.09
	pH7	pH units	6.9 - 7.1	7.01	7.01
	DO 0%	PPM	0.1 ppm	0.02	0.01
	Ambient Air (100%)	PPM	0.5 ppm	Y	Y
12/01/2022	EC 1,413	mS/cm	5%	-	1,451
	pH4	pH units	3.9 - 4.1	-	4.09
	pH7	pH units	6.9 - 7.1	-	6.95
	DO 0%	PPM	0.1 ppm	-	0
	Ambient Air (100%)	PPM	0.5 ppm	-	Y
13/01/2022	EC 1,413	mS/cm	5%	1,413	1,332
	pH4	pH units	3.9 - 4.1	4.1	4.09
	pH7	pH units	6.9 - 7.1	6.95	6.94
	DO 0%	PPM	0.1 ppm	0.01	0
	Ambient Air (100%)	PPM	0.5 ppm	Y	Y
14/01/2022	EC 1,413	mS/cm	5%	1,344	-
	pH4	pH units	3.9 - 4.1	4.12	-
	pH7	pH units	6.9 - 7.1	6.99	-
	DO 0%	PPM	0.1 ppm	0.02	-
	Ambient Air (100%)	PPM	0.5 ppm	Y	-

Note: Bump Test readings outside the acceptable range are in red

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Cardno
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20K104050
Cable length: 1m 20K100096

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	175.10 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.41
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV -3 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	24.7	-0.2	°C	NA	24.5	°C
pH (21A)	pH 7.00	361531	7.01	-22.00	mV	7.04	7.01	pH
pH (21A)	pH 4.00	362911	4.00	153.10	mV	4.03	4.00	pH
Conductivity (20K100397)	2764 µs/cm at 25°C	21/2701	2764	GLP	5.06	2791	2764	µs/cm
ORP (201005SIA605102)	Zobell A & B	21/1908	230	230	mV	228.9	232.6	mV
Zero DO (20H100139)	NaSO3 in distilled water	10175	0.0	NA	NA	1	0.0	%
100% DO (20H100139)	100% Air Saturation	Air	100.0	5.95	uA	96.2	100.0	%

Calibrated by: [redacted]

Calibration Date: 02-Jan-22
Next Due: 01-Jul-22

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Cardno
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 19L102400
Cable length: 1m 19H100045

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	175.90 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.58
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV -3 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	25.3	-0.3	°C	NA	25	°C
pH (21E)	pH 7.00	361531	7.01	-17.20	mV	6.99	7.01	pH
pH (21E)	pH 4.00	362911	4.00	158.70	mV	4.01	4.00	pH
Conductivity (19G100450)	2764 µs/cm at 25°C	21/2701	2764	GLP	5.00	2743	2764	µs/cm
ORP (200124SEN605102)	Zobell A & B	21/1908	229	229	mV	228.3	232	mV
Zero DO (20B140053)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.8	0.0	%
100% DO (20B140053)	100% Air Saturation	Air	100.0	6.28	uA	105.1	100.0	%

Calibrated by: [redacted]

Calibration Date: 02-Jan-22
Next Due: 01-Jul-22

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Cardno
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105325
Cable length: 4m (21F100778)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	174.70 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.56
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 8 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	22.2	0	°C	NA	22.2	°C
pH 21G	pH 7.00	361531	7.01	-7.30	mV	7.05	7.01	pH
pH 21G	pH 4.00	362911	4.00	167.40	mV	4.02	4.00	pH
Conductivity (21H100008)	2764 µs/cm at 25°C	21/2701	2764	GLP	5.03	2804	2764	µs/cm
ORP (Reference check only) 21O	Zobell A & B	21/0502	235	235	mV	222.2	227.1	mV
Zero DO (21G100131)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.1	0.0	%
100% DO (21G100131)	100% Air Saturation	Air	100.0	5.9	uA	100.3	100.0	%

Calibrated [redacted]

Calibration Date: 18-Nov-21
Next Due: 17-May-22

Calibration Report

Multi-Parameter Water Quality Instrument

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105325
Cable length: 4m (21F100778)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	174.70 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.56
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 8 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

				Instrument Readings				
Parameter	**Standards**	**Calibration Point**	**Units**	**Before**		**After**		**Units**
Temperature	Check Temp NATA		°C	NA		22.4		°C
pH 21G	pH 7.00	7.01	mV	7.08		7.01		pH
pH 21G	pH 4.00	4.00	mV	4.06		4.02		pH
Conductivity (21H100008)	1359 µs/cm at 22.4°C	2764	5.03	1352 @ 22.4		1354 @22.4		µs/cm
ORP (Reference check only) 21O	Zobell A & B	235	mV	238.4		240.1		mV
Zero DO (21G100131)	NaSO3 in distilled water	0.0	NA	0		0		%
100% DO (21G100131)	100% Air Saturation	100.0	uA	100				%

Calibrated by: [redacted] **Calibration Date:** 23/12/21

APPENDIX

E

DATA QUALITY REVIEW

Data Quality Review
PFAS Ongoing Monitoring Plan Quarterly Monitoring Factual Report

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as field blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 10 -14th January 2022 and is in accordance with the proposed scope of work, as documented in the SAQP (ref DEF19009_ HMAS_Stirling_SAQP_Rev6) issued to the client and in general compliance with the Australian standards AS 4482.1- 2005 "*Guide to Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile Compounds",* Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling* and NEPM "*National Environment Protection (Assessment of Site Contamination) Measure".* A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (DEF19009_2021 Q4 OMP Factual Report_HMAS Stirling). In addition, a Health, Safety and Environment Work Method Statement (HSEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. **Groundwater, surface water and pore water:** No holding time non-compliance was reported for any water samples. **Sediment:** No holding time non-compliance was reported for the sediment samples.
Background samples	No background samples were collected as part of this investigation.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report, and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
	Data Precision & Accuracy

QC sample type	SAQP required frequency	Sample Collected
Blind duplicate	1 in 10 primary water samples (10%) >1 in 20 primary sediment samples (>5%)	14 for 125 primary water samples (11.2%) 4 for 39 primary sediment samples (10.2%)

<table>
<tr><th>QA/QC Aspects</th><th>Evidence & Evaluation</th></tr>
<tr><td></td><td>
<table>
<tr><td>Split duplicate</td><td>1 in 10 primary water samples (10%)
>1 in 20 primary sediment samples (>5%)</td><td>14 for 125 primary water samples (11.2%)
4 for 39 primary sediment samples (10.2%)</td></tr>
<tr><td>Rinsate</td><td>1 per day / equipment used</td><td>9 (3x equipment for 1 day; 2x equipment for 2 days
and 1x equipment for 2 days) (100%)</td></tr>
<tr><td>Field Blank</td><td>1 per day / field team (esky)</td><td>9 (3x equipment for 1 day; 2x equipment for 2 days
and 1x equipment for 2 days) (100%)</td></tr>
</table>
QC sample frequency was compliant with the SAQP for water and sediment duplicates, rinsates and field blanks.
</td></tr>
<tr><td>QC Testing – Blind Replicates (Primary Lab)</td><td>
▪ Relative Percentage Difference (RPD) Acceptance Criteria:
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table>
Groundwater, Porewater & Surface water
▪ Number of primary samples analysed: 125
▪ Duplicate samples analysed: 14
The level of RPD is generally minor and probably related to the low analyte concentrations of analyte pairs.
Sediment
▪ Number of primary samples analysed: 39
▪ Duplicate samples analysed: 4
The level of RPD is generally minor and probably related to the low analyte concentrations of analyte pairs.
</td></tr>
<tr><td>QC Testing – Field Splits (Secondary Lab)</td><td>
▪ Relative Percentage Difference (RPD) Acceptance Criteria:
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table>
Groundwater, Porewater & Surface water
▪ Number of Samples Analysed: 139 (including QC)
▪ Field Split Samples Analysed: 14
The level of RPD is generally minor and probably related to the low analyte concentrations of analyte pairs and/or difference of methodologies between the primary and secondary laboratories.
Sediment
▪ Number of Samples Analysed: 43 (including QC)
▪ Field Split Samples Analysed: 4
The level of RPD is generally minor and probably related to the low analyte concentrations of analyte pairs and/or difference of methodologies between the primary and secondary laboratories.
</td></tr>
<tr><td>Field Blanks</td><td>Field Blanks were collected at a rate of one per field team (esky) per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.</td></tr>
<tr><td>Laboratory Internal QC</td><td>Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and</td></tr>
</table>

QA/QC Aspects	Evidence & Evaluation
	satisfactory results for method blank, laboratory control samples and laboratory duplicates. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2200211 (sample ID: anonymous); EP2200212 (sample ID: SW134); EP2200214 (sample ID: anonymous); EP2200215 (sample ID: anonymous); EP2200216 (sample ID: MW124); EP2200218 (sample ID: anonymous); EP2200240 (sample ID: PW380); EP2200241 (sample ID: anonymous); EP2200338 (sample ID: SW309); EP2200340 (sample ID: anonymous); EP2200343 (sample ID: PW374). - Water sample Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2200211 (sample ID: MW193); EP2200214 (sample ID: anonymous) - Water sample PFHxS, PFOS and PFHxA matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2299340 (sample ID: MW289); EP2200343 (sample ID: anonymous) - Water sample PFHxS matrix spike recovery not determined due to the background concentrations exceeding the 4x spike level. ▪ EP2200338 (sample ID: anonymous), EP2200339 (sample ID: MW282) - Water sample PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFHxA, PFHpA, PFOA matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. All Quality Control sample frequencies were of an acceptable rate (%) with exception of the following: ▪ EP2200211 - 8.11%; EP2200240 – 5.26%; EP2200288 – 5.56%; EP220089 – 5.56%; EP2200338 – 5.26%; EP2200339 – 5.26%. - Lab duplicates for PFAS were undertaken less than the target rate of 10%. ▪ EP2200216 – 9.09% & 0.00%; EP2200218 – 0.00% & 0.00%; EP2200241- 3.85% & 3.85%; EP2200399 – 0.00% & 0.00%; EP2200400 – 5.88 % & 0.00%. - Lab duplicates and matrix spikes for PFAS were undertaken less than the target rate of 10% and 5%, respectively. ▪ EP2200289 - 0.00% & 0.00%; EP2200216 – 9.09% & 0.00%. - Lab duplicates and matrix spikes for Chloride and Sulfate were undertaken less than the target rate of 10% and 5%, respectively.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use. The equipment calibration certificates are provided in Appendix D. Cardno undertook in-field calibration checks (bump tests) for each YSI water quality meters per day of sampling. The bump tests found all parameters to be within the acceptable range. As such, Cardno is satisfied that the equipment calibrations were acceptable for this assessment.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day when reusable equipment is used (i.e. YSI, dipper, pore water sampler...). All rinsate samples tested reported analytes concentrations below the laboratory LORs.

QA/QC Aspects	Evidence & Evaluation
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process for groundwater, porewater, surface water and sediment and therefore, the data set used as the basis for the investigation is considered valid and complete.

APPENDIX

F

INFORMATION ABOUT ENVIRONMENTAL REPORTS

About Site Environmental Assessment Reports

1. Introduction

This document explains the Environmental Site Assessment (ESA) process and the context that applies to the use of Environmental Reports issued by Cardno.

2. What is an ESA?

Environmental Site Assessments (ESA) are undertaken for a range of purposes, specific to the brief issued by the client in each case. The scope may include one or a combination of any of the following:

- A factual report of the condition of a portion of the site or one aspect of an entire site.
- Assessment of the contamination levels in soil to be removed from a site – a waste classification assessment.
- Validation of the success of remediation of a site or a portion of a site.
- Provision of a professional opinion about the suitability of a site for one or more uses, in terms of its contamination status.

The scope of any ESA needs to be defined at the outset.

An ESA is not an Environmental Audit. Such audits are undertaken in accordance with the provisions of regulations enacted in various states of Australia, and are referred to as Site Audits in some jurisdictions. Statutory audits provide certification by EPA accredited auditors that a site is suitable for one or more uses. An ESA may provide similar advice but cannot be used in place of an audit if the latter is required by regulation in any instance. However in some circumstances and jurisdictions an ESA is sufficient to provide "environmental sign-off" of a site.

An ESA may be undertaken for due diligence purposes, to establish whether the site has been impacted to the extent that some beneficial uses of the site may be precluded. Due diligence audits in many cases may be completed as non-statutory Audits, although in some jurisdictions they can also be statutory audits, if defined as such at the outset.

3. The ESA Process

The Client generally initiates the ESA process by specifying a brief which identifies the specific objectives of the assessment. If not, it is the consultants' duty to so specify the ESA

In the case of an ESA to provide an opinion about the suitability of the site for use, it would be conducted in accordance with NEPM (Site Assessment). Such ESA would not commence until a thorough site history assessment (Phase 1 Assessment: to identify the potential for significant contamination at a site) is conducted. However, where the history is unclear, a broad screening of chemical parameters can be used to test environmental media. This normally includes a broad range of organic and inorganic compounds and elements, often referred to as an Environmental Screen.

(In the case of an ESA for a purpose other than to provide an opinion about the suitability of the site for use, it is not always necessary to undertake a Phase 1 assessment.)

The ESA requires sampling of soil at representative locations across the site. A NATA accredited laboratory performs the analysis of soil. It is impractical for all of the soil to be assessed. The ESA is often based on a statistical method of grid or random sampling, augmented by targeted sampling at locations known or suspected to be contaminated. Guidance on sampling strategy and density is provided in Australian Standard AS4482.1–2005. However, some considerable degree of judgement is still required in the application of any sampling and testing strategy. For example the blanket application of the "hot spot" method presented in this standard is often inappropriate given its limitations.

The field program also investigates the likelihood of contamination below the site surface. Field investigations must sample and test fill as well as the natural soils. If contamination is found then it is common for further work to be undertaken to characterise, to the extent practical, its vertical and horizontal extent. However, where fill is encountered and testing shows it to be uncontaminated, it must be realised that the heterogeneous nature of the material might mean that not all pockets of contaminated material can be detected using normal sampling regimes.

EPA guidelines for auditors, that may be relevant for an ESA, indicate the need in all cases to consider the potential for groundwater contamination in any site. This does not mean all sites need to be drilled to sample groundwater, but it is most often the case. Most hydrogeological settings and groundwater conditions are complex and vary in space and time. The condition of groundwater is investigated to identify if any beneficial use or environmental value of groundwater is precluded due to contamination.

As previously stated for soil, all groundwater at the site cannot be tested. The environmental investigations are conducted in accordance with industry standards and guidelines (e.g. EPA Vic Pub 668). This provides a level of confidence that a sufficiently comprehensive assessment of the groundwater at the site is achieved.

Where an investigation shows that groundwater is polluted, consideration should be given to assessing the risks and the need for and practicality of any clean up.

4. Environmental Assessment Report

The ESA Report details the findings of the ESA. It provides summary information on the site definition, the reasons for the assessment and other relevant facts. It reviews the scope and quality of the site investigations, laboratory testing and data analyses undertaken. These reports also present a review of the contamination status of the site, the need for any further clean up, and an opinion on the suitability of the site for a range of beneficial uses and land uses such as “residential – low density”, “commercial” etc, as appropriate.

However, as noted above, some ESA have a narrow scope such as for classification of waste soil for removal from site, and do not make conclusions on suitability of site for use.

The ESA Report generally includes copies of other documents and reports, necessary to support the assessment findings, presented as appendices. These can contain more detailed information than the body of the ESA Report. Care should be taken to also read the appended documents and the ESA report in full.

Cardno generally issues reports in electronic form (e-Report) on CD ROM. ESA Reports are issued in this format as Adobe Acrobat™ PDF files. However, a paper copy of the executive summary of the ESA Report is generally issued to the client, and others as required by the brief or by regulation.

5. Limitations of Environmental Assessment Report

The ESA Report is prepared in a manner that can be easily read by a lay person with a legitimate interest in the contamination status of the site, such as the site owner or occupier, EPA and Local Planning Authority. The ESA report is not intended for use by other parties or for other purposes. Anyone who uses the assessment report for purposes other than specified in the report, does so at their own risk.

The site should only be used for one or more of the beneficial uses and land uses identified in the ESA as suitable.

The conditions and qualifications may apply to the suitability of the site for use, and it is the responsibility of the Client to be cognizant of and accept these in accepting the report. Cardno are only responsible for the issuing of the ESA report but accepts no liability for the costs incurred in the implementation of ESA findings.

The ESA provides a “snapshot” of the site conditions at the time of the site investigation. Consequently, the report may not be valid at a later time if there has been any change to the contamination status of the site in that time. Verification of the status of the site may be required in cases where a significant time has elapsed, or site conditions have changed since the assessment and audit.

The ESA is necessarily limited by constraints such as time, cost and available information; although normal professional practice at the time has been applied with all due care to prepare the report. A necessary requirement of this process is the horizontal and vertical interpolation of data from discrete locations. However, site conditions are generally not homogenous and some discrepancies will occur between the actual and predicted results at locations not directly sampled. There is a risk that contamination may occur at the site and not be identified by a competent investigation and assessment. The approach adopted in sampling (a combination of statistically based grid and judgmental sampling) seeks to reduce, but cannot eliminate, this risk.

Where unexpected occurrences of contamination arise, subsequent to the issue of the ESA Report, Cardno should be permitted to make an interpretation of these facts in relation to the ESA Report findings. Consequently, the Client should inform Cardno and seek their opinion. Cardno accepts no liability for costs incurred due to such

unexpected occurrences, given the inherent uncertainties in the assessment process.

Cardno uses information provided by other parties as the basis for the ESA, and reliance on this information is at the discretion of Cardno. However, however Cardno cannot guarantee any of the facts, findings or conclusions presented by other parties. Cardno will not be liable for the use of information, provided by others that is subsequently found to be intentionally misleading.

The ESA Report is not and does not purport to be anything other than a contaminated land ESA. It is not a geotechnical report and bore logs reproduced are for interpretation of the likely distribution of contamination. They are not intended for geotechnical interpretations and may not be adequate for this purpose.

The ESA Report is not intended to be a comprehensive analysis of the presence and associated risk of asbestos in buildings and services. Where asbestos in buildings and services is known or likely, the report may only caution that an appropriately qualified person be engaged to undertake demolition to avoid contamination of the site.

Cardno

13 August 2015

PFAS OMP Quarterly Sampling Event Factual Report

March 2022

HMAS Stirling

DEF19009



Prepared for

Department of Defence

3 August 2022

Cardno

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Version Number	Rev 2

Document History

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0	20/04/2022	External Draft (Client review)	[redacted]	[redacted]
1	08/07/2022	Rev 1	[redacted]	[redacted]
2	03/08/2022	Rev 2	[redacted]	[redacted]

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluoro-hexane Sulphonate
PFOA	Per-fluoro-octanoic Acid
PFOS	Per-fluoro-octane Sulfonate

Technical Terms

AFFF	Aqueous Film-Forming Foam
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
BGL	Below Ground Level
CEC	Cation Exchange Capacity
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
EC	Electrical Conductivity
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity - Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTG	Fire Training Ground
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

Cardno was engaged by the Australian Department of Defence ("the Client") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) at HMAS Stirling ("the site"). The site is located on Garden Island, Western Australia.

The OMP was carried out in accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP):

> Cardno, 9 March 2022, Reference: DEF19009, 'PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling'.

The SAQP was reviewed prior to the monitoring event and updated as required (groundwater monitoring location MW500 added to replace decommissioned groundwater monitoring location MW117).

For the purposes of this report:

> The Management Area was defined as comprising of Garden Island and the marine nearshore environment (Figure 1B, Appendix A).

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF).

The purpose of this PFAS OMP factual report is to provide an up-to-date status of the condition of the site as it is currently understood in relation to the most recent sampling event.

The objectives of the report are:

> To provide a succinct summary of the Q1 2022 sampling event and provision of analytical results with supporting tables and figures.

> To provide confirmation of the current understanding of risk.

> To provide supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

This assessment has been undertaken in general accordance with applicable industry standards for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

> National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013) (ASC NEPM).

> Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, PFAS National Environmental Management Plan (NEMP) 2.0.

> Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds.

> Standards Australia 1998. AS/NZ 5667:1998 Water quality – sampling.

> Australian and New Zealand Guidelines, 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

> Department of Water and Environmental Regulation (DWER), 2021, Assessment and Management of Contaminated Sites[1].

[1] It is noted that Site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-Site private properties and waterways.

> Department of Defence, Department of Energy, 2018, Quality System Manual Schedule B15.

> U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.

> USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.

> National Health and Medical Research Council (NHMRC), August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment.

2.1 Groundwater Monitoring

Sampling of selected groundwater bores was performed in general accordance with the SAQP (Cardno, 2022), applying methods set out in Section 3 of this report. The groundwater bores monitored as part of the OMP are presented in Table 2-1, and are shown on Figure 2, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID
Demolition Ground	MW137, MW139, MW141, MW142, MW147, MW149, MW272
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128
Waste water treatment plant	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203,
Accommodation Area	MW288, MW289
Dredge Spoil / Careening Bay	MW264, MW268, MW269
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW516, MW248, MW249
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259, MW261, MW517, MW518, MW010
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2022), applying methods set out in Section 3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3 to 5, Appendix A.

Table 2-2 Porewater, Surface Water and Sediment Monitoring Locations

Monitoring Area	Porewater Sampling Location ID	Sediment Sampling Location ID	Surface Water Sampling Location ID
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	SD329, SD330, SD331, SD356, SD357, SD358	SW150, SW152, SW154, SW156
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	SD335, SD340, SD341, SD362, SD363, SD364	SW130, SW132, SW134
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384
Accommodation Area	PW346	SD346	
Dredge Spoil / Careening Bay	PW374, PW375, PW378	SD374, SD375, SD378	SW317, SW318, SW319
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416

2.3 Data Management

All the data included in the report has been collected, uploaded to the ESdat database and reviewed according to the data management requirements of the Defence Contamination Management Manual (DCMM Annex L).

The sample naming convention detailed in the DCMM Annex L was used in the field.

2.3.1 Defence ESdat database

Data collected as part of the Q1 2022 OMP monitoring event was uploaded to the ESdat database according to the data management requirements of the DCMM Annex L, including:

- All field data collected was uploaded;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q1 2022 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW128, MW147, MW172, MW197, MW220, MW236, MW248, MW518	Not sampled	These wells were found dry during this monitoring event. Limited impact – No data collected for Q1 2022 However most of these bores are consistently or seasonally dry and other bores are sampled nearby.
MW258	Not sampled	Bore blocked at 3.69 mBGL. Medium impact (no data collected) Repairs or replacement recommended.
MW137, MW272	Not sampled	These wells were not found and are assumed to have been destroyed by the winter 2021 storms which washed away part of the beach. Medium impact – No data collected. Other bores are sampled nearby. Replacement recommended due to proximity with both a source area and sensitive receptor.
MW264	Not sampled	MW264 was destroyed by recent earthworks within the accommodation area. Limited impact – No data collected. Other bores are sampled nearby.
SW383	Not Analysed	Sample was not received by the laboratory – assumed misplaced in the field.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was generally undertaken by no purge HydraSleeve® method as detailed in Table 3-1.

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	Standing Water Levels (SWL) were gauged using an interface probe. All wells were measured against a specified mark at the top of the well casing. Snap gauging was undertaken in each area presented on Figure 6 (Appendix A) to take in consideration tide influence. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater field parameters were recorded via a down-hole water quality meter (positioned within the mid screen interval) prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature. Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve	HydraSleeve were deployed with top weight for sample collection to begin at the lowest point. Following sampling, new hydrasleeves were deployed in preparation for the next OMP monitoring event using the same string for consistency (same depth of sampling i.e. within screen depth).
Retrieval of HydraSleeves (Sample Collection)	HydraSleeve sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the hydrasleeve. Purging of the well was undertaken prior to sampling to make sure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume). A sample was collected once field parameters had stabilised.
Decontamination procedure	Dedicated HydraSleeves and HDPE hand bailers were used at each groundwater bore thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample was labelled with the sample location, date, project identification number and sampler's initials. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

Activity	Details
Quality Control	Groundwater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and Chain of Custody documentation are included in Appendix C.

3.2 Porewater and Sediment Sampling Methodology

The methodologies for sediment and porewater sampling are detailed in Table 3-2 and Table 3-3 respectively.

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 20 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 20 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the USEPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.

Item	Detail
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 3-4.

Table 3-4 Surface water Sampling Methodology

Item	Details
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature. Field observations such as odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container was positioned 10 cm below the surface water level where possible and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples were decanted into the laboratory supplied sample containers. Samples were collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) '*Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*'.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Surface water QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Surface water samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP:

> QA documentation.

> Bias.

- Data Representativeness.
- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability.
- Data Set Completeness.

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E. The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 3-5.

Table 3-5 Criteria for Groundwater, Porewater and Surface Water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health - Drinking Water Quality Guideline	0.07[1]	0.56	HEPA 2020
Human Health – Recreational Water	2[1]	10	NHMRC 2019
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only; The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement.

3.5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment will be assessed against the NEMP (HEPA, 2020) soil criteria for consistency with the SAQP (Cardno, 2022), DSI (RPS, 2018b) and ERA (RPS, 2018c). The adopted assessment criteria for sediments are detailed in Table 3-6.

Table 3-6 Criteria for Sediment

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	mg/kg		
Human Health - Commercial / industrial (on-base activities)	20[1]	50	HEPA 2020
Ecological - Direct exposure (interim guidelines)	1[2]	10	HEPA 2020
Ecological - Indirect exposure (interim guidelines) (on site)	0.01[2]	-	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only

4 Field Observations and Results

4.1 General Site Observations

No weather event that could have impacted the sampling or results obtained was observed. Major earthworks were observed within the accommodation area which prevented sampling of MW264 (destroyed). This is not likely to have impacted the results obtained as part of this event. No dewatering activities were noted.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling record sheets, included in Appendix D. Field parameters were generally consistent with the previous monitoring event. Groundwater pH was near neutral to slightly alkaline, water was clear to brown in colour and fresh to saline. Groundwater temperature ranged from 18.8°C (MW233) to 25.6°C (MW121). DO readings mostly indicate aerobic groundwater condition. EC readings ranged from 342.1 µS/cm (MW233) to 52,750 µS/cm (MW149) and indicate fresh to highly-saline groundwater conditions. There was a sulphur odour noted at several groundwater wells potentially related to acid sulphate soils occurring at the site.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Appendix D. The groundwater elevations ranged between 0.061 mAHD (MW127) and 0.854 mAHD (MW226). It is expected that groundwater levels and migration are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours in discreet areas of the site. Groundwater flow was interpreted to be radial from the site (i.e. groundwater flows towards the ocean), following local topography, which is consistent with previous monitoring events. Groundwater inferred elevation contours and flow direction for the Q1 2022 monitoring event are shown in Figure 6, Appendix A.

4.2.2 Groundwater Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-1. Laboratory results have also been compared to available historical data in order to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figure 2 in Appendix A presents the groundwater monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW120, MW141, MW193, MW236, MW256, MW282, MW500	0.56[2]	12.0 (MW282)	57	7
Sum of PFHxS and PFOS	MW010, MW109, MW112, MW120, MW121, MW123, MW125, MW141, MW142, MW161, MW166, MW173, MW193, MW215, MW216, MW217, MW224, MW228, MW233, MW240, MW245, MW249, MW255, MW256, MW257 MW259, MW268, MW269, MW282, MW288, MW289, MW500, MW516	0.07[2]	140 (MW282)	57	33
PFOS	MW010, MW109, MW112, MW120, MW121, MW123, MW141, MW142, MW161, MW166, MW173, MW193, MW202, MW216, MW217, MW224, MW233, MW242, MW243, MW245,	0.01[3]	81.2 (MW141)	57	33

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
	MW249, MW255, MW256, MW257 MW259, MW268, MW269, MW282, MW288, MW289, MW500, MW516, MW517				

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the groundwater monitoring locations in Q1 2022.

4.3 Porewater

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring event. Porewater pH was near neutral, with a temperature recorded between 23°C and 27.4°C (mean=25.4°C). Water was generally clear and EC/TDS readings indicate saline to highly-saline porewater conditions. DO readings mostly indicate aerobic porewater conditions. No visual or olfactory evidence of contamination were observed.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data. Figure 4 in Appendix A presents the porewater monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	39	0
Sum of PFHxS and PFOS	PW345, PW346	0.07[2]	1.76 (PW346)	39	2
PFOS	PW304, PW331, PW335, PW340, PW341, PW345, PW346, PW350, PW362, PW363, PW364, PW367, PW368, PW369, PW375, PW401	0.01[3]	1.12 (PW346)	39	16

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q1 2022.

4.4 Surface Water

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring event. Surface water pH was near neutral, temperature was 25.5°C on average, water was clear and EC readings (average of 56,570 µS/cm) indicate highly-saline conditions. DO readings (average 4.16 mg/L) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.4.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data. Figure 3 in Appendix A presents the surface water monitoring locations where a first time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-3 Summary of surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	27	0
Sum of PFHxS and PFOS	SW373	0.07[2]	0.12 (SW373)	27	1
PFOS	SW370, SW372, SW373	0.01[3]	0.06 (SW371)	27	3

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q1 2022.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling record sheets within Appendix D. Sediment samples were generally described as beige/grey, coarse, wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. Soil criteria are adopted in the absence of criteria for sediment for consistency with the SAQP (Cardno, 2022), DSI (RPS, 2018b) and ERA (RPS, 2018c). A summary of results is presented in Table 4-4. Laboratory results have also been compared to available historical data. Figure 5 in Appendix A presents the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-4 Summary of Sediment Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (mg/kg)	Max Conc. (mg/kg)	No. Analytical Results[4]	No. Results Above Criteria
PFOA	-	10[1]	<0.0002	39	0
Sum of PFHxS and PFOS	-	20[3]	0.0177 (SD346)	39	0
PFOS	SD246	0.01[2]	0.0153 (SD346)	39	1

Notes:

1. Ecosystems – direct exposure
2. Ecological - indirect exposure
3. Human health – comm/industrial
4. Non-inclusive of quality control samples

Findings are summarised as follows:

> No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the sediment monitoring locations in Q1 2022.

4.6 Changes to the Monitoring Network Condition

No recent change to the monitoring network that could have impacted the data integrity was noted during the Q1 2022 monitoring event.

5 Summary and Conclusions

Cardno undertook the 2022 Q1 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Groundwater sampling and testing was undertaken at 57 monitoring bores, 27 surface water locations and 39 sediment and porewater co-located sampling locations. Nine (9) monitoring wells could not be sampled as the wells were found dry or blocked, three (3) wells were not found (destroyed) and one surface water sample was not analysed (misplaced in the field).

Groundwater levels were gauged in all wells before sampling. Groundwater flow was interpreted to be radial from the site where mounding of groundwater is occurring (i.e. groundwater follows the site's topography and flows towards the ocean), consistent with the previous monitoring events.

The groundwater laboratory results reported the following:

- Of the 57 samples that were tested, PFOA (7 samples), PFOS (33 samples) and Sum of PFHxS and PFOS (33 samples) reported concentrations that exceeded adopted assessment criteria.
- No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the groundwater monitoring locations.

The surface water laboratory results reported the following:

- Of the 27 samples tested, PFOS (3 samples) and Sum of PFHxS and PFOS (1 sample) were reported above the adopted assessment criteria.
- No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values was reported for the surface water monitoring locations.

The porewater laboratory results reported the following:

- Of the 39 samples that were tested, PFOS (16 samples) and Sum of PFOS and PFHxS (2 samples) reported concentrations above adopted assessment criteria.
- No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations.

The sediment laboratory results reported the following:

- Of the 39 samples that were tested, no sampling location reported a first time detection or new exceedance of guideline values.

The following actions should be undertaken prior to the next OMP sampling event:

- Replacement of the ground water monitoring wells lost at the demolition ground and main base area.
- Blocked wells should be unblocked (where possible) during the next sampling event.

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q2 2022), scheduled for June 2022. An Annual Interpretive Report will be prepared following the Q3 2022 monitoring event for the 2021 –2022 reporting period.

6 References

General References

1. Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds.
2. Australian Standard AS 4482-1999 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 2 – Volatile substances.
3. Australian Water Quality Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000).
4. *Contaminated Sites Act 2003*, Western Australia.
5. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement Technical Guidelines for the Estimation of Emissions by Facilities in Australia.
6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
8. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, '*Guidance on Environmental Data Verification and Data Validation'.*
9. The Heads of EPAs Australia and New Zealand (HEPA; 2020) PFAS National Environmental Management Plan (NEMP) 2.0, January 2020.
10. National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011 – updated 2018) National Water Quality Management Strategy Australian Drinking Water Guidelines 6, August 2018
12. NHMRC, August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.
13. Standards Australia/Standards New Zealand (1998) AS5667.1:1998 *'Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'*.
14. U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
15. USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.

Site Specific References

16. Department of Defence, January 2019, HMAS Stirling Garden Island PFAS Management Area Plan, Final.
17. Cardno, 9 March 2022, Reference: DEF19009, 'PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling'. Rev 6
18. Cardno, 16 April 2020, PFAS OMP 2019 Q4 Quarterly Monitoring Factual Report, HMAS Stirling
19. Cardno, 14 May 2020, PFAS OMP 2020 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling
20. Cardno, 23 September 2020, PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling
21. Cardno, 22 January 2021, PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report, HMAS Stirling
22. Cardno, March 2021, PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report, HMAS Stirling
23. Cardno, June 2021, PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report, HMAS Stirling
24. Cardno, August 2021, PFAS OMP 2021 Q2 Quarterly Sampling Event Factual Report, HMAS Stirling
25. Cardno, September 2021, PFAS OMP – 2020 Annual Interpretive Report, HMAS Stirling
26. Cardno, November 2021 PFAS OMP 2021 Q3 Quarterly Sampling Event Factual Report, HMAS Stirling
27. Cardno, April 2022 PFAS OMP 2021 Q4 Quarterly Sampling Event Factual Report, HMAS Stirling

28. RPS, October 2018, HMAS Stirling - PFAS Ongoing Monitoring Plan, Ref. EEC16094.005 (RPS, 2018a).

29. RPS, May 2018, Detailed Site Investigation – HMAS Stirling PFAS Investigation, Ref. EEC16094.003 (RPS, 2018b).

30. RPS, September 2018, HMAS Stirling Garden Island PFAS Investigation Ecological Risk Assessment. Ref. EEC16094.009 (RPS, 2018c).

APPENDIX A

FIGURES

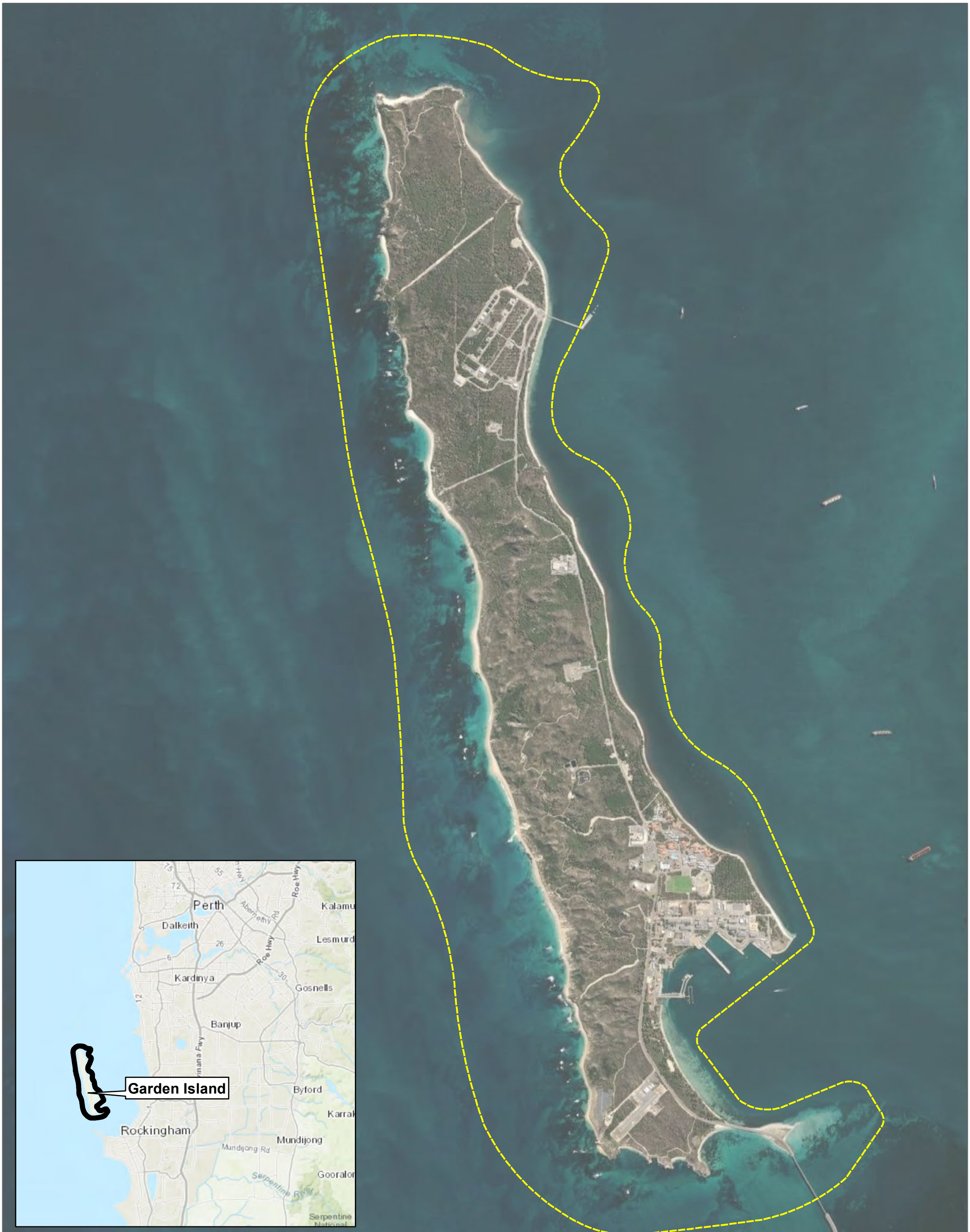


FIGURE 1A

1:32,000 Scale at A3

Meters

0 500 1,000

Site Location

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2022-04-14 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001A_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map



FIGURE 1B

1:32,000 Scale at A3

Meters

0 500 1,000

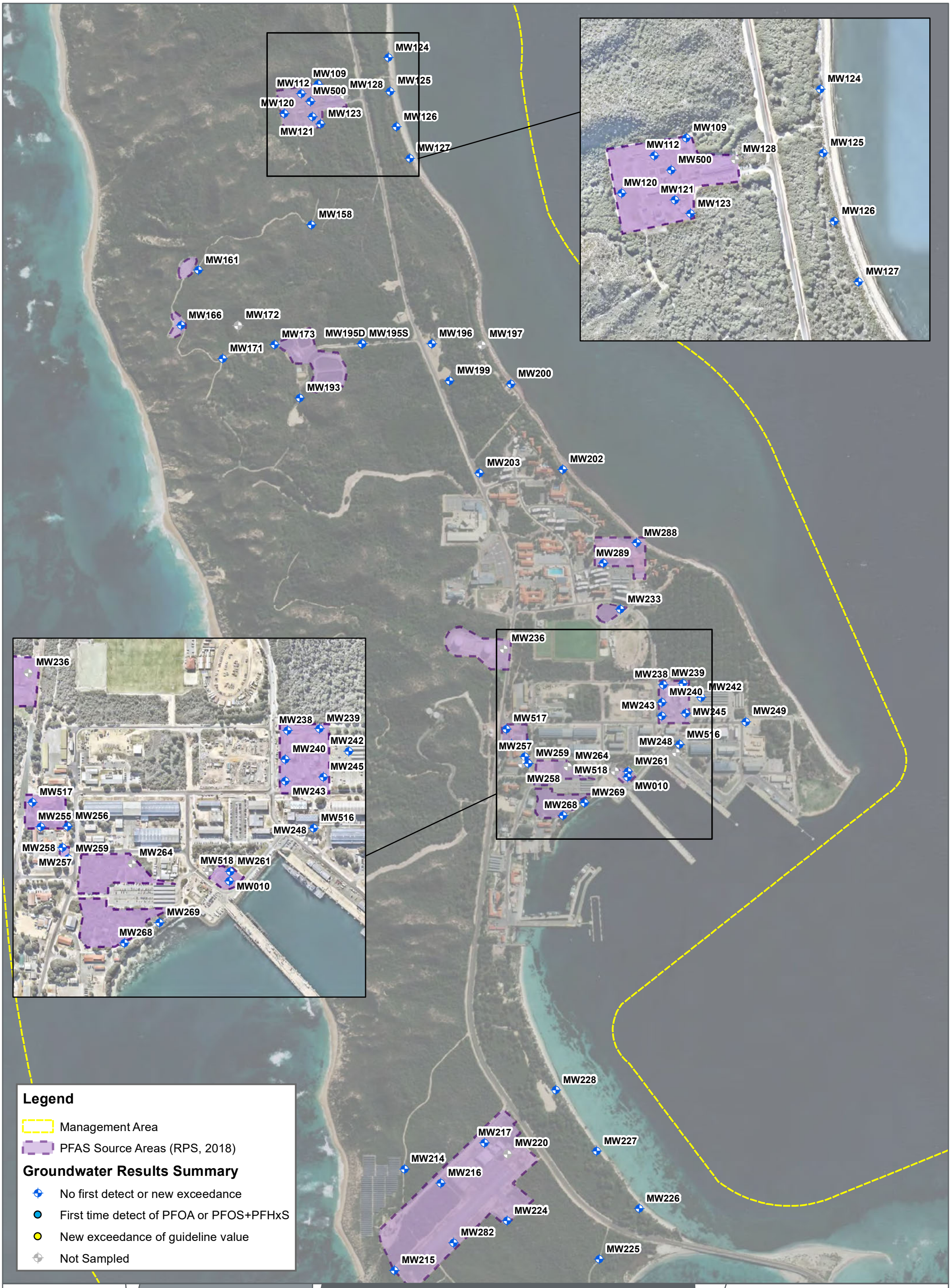
Management Area

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-04-14 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap


MW124
MW109
MW112
MW128
MW125
MW500
MW120
MW123
MW126
MW121
MW127
MW158
MW161
MW166
MW172
MW173
MW195D
MW195S
MW196
MW197
MW171
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW517
MW516
MW257
MW248
MW259
MW264
MW261
MW518
MW258
MW010
MW269
MW268
MW255
MW256
MW228
MW217
MW220
MW227
MW214
MW216
MW226
MW224
MW282
MW225
MW215
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
Not Sampled
FIGURE 2A
1:12,500 Scale at A3
Meters
0
300
600
Groundwater Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-04-18 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2022Q1_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

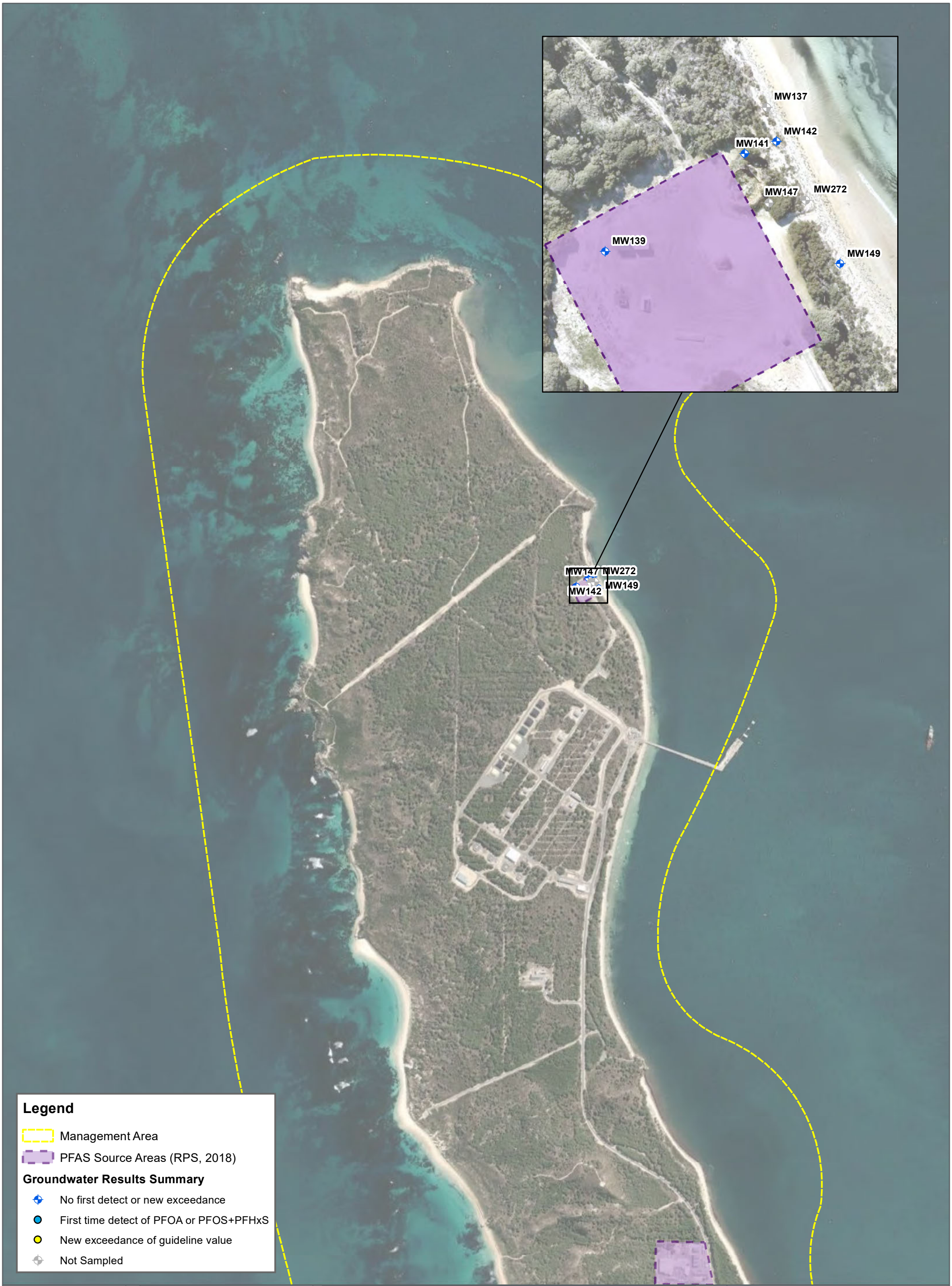


FIGURE 2B

1:15,000 Scale at A3

Groundwater Results

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-04-18 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
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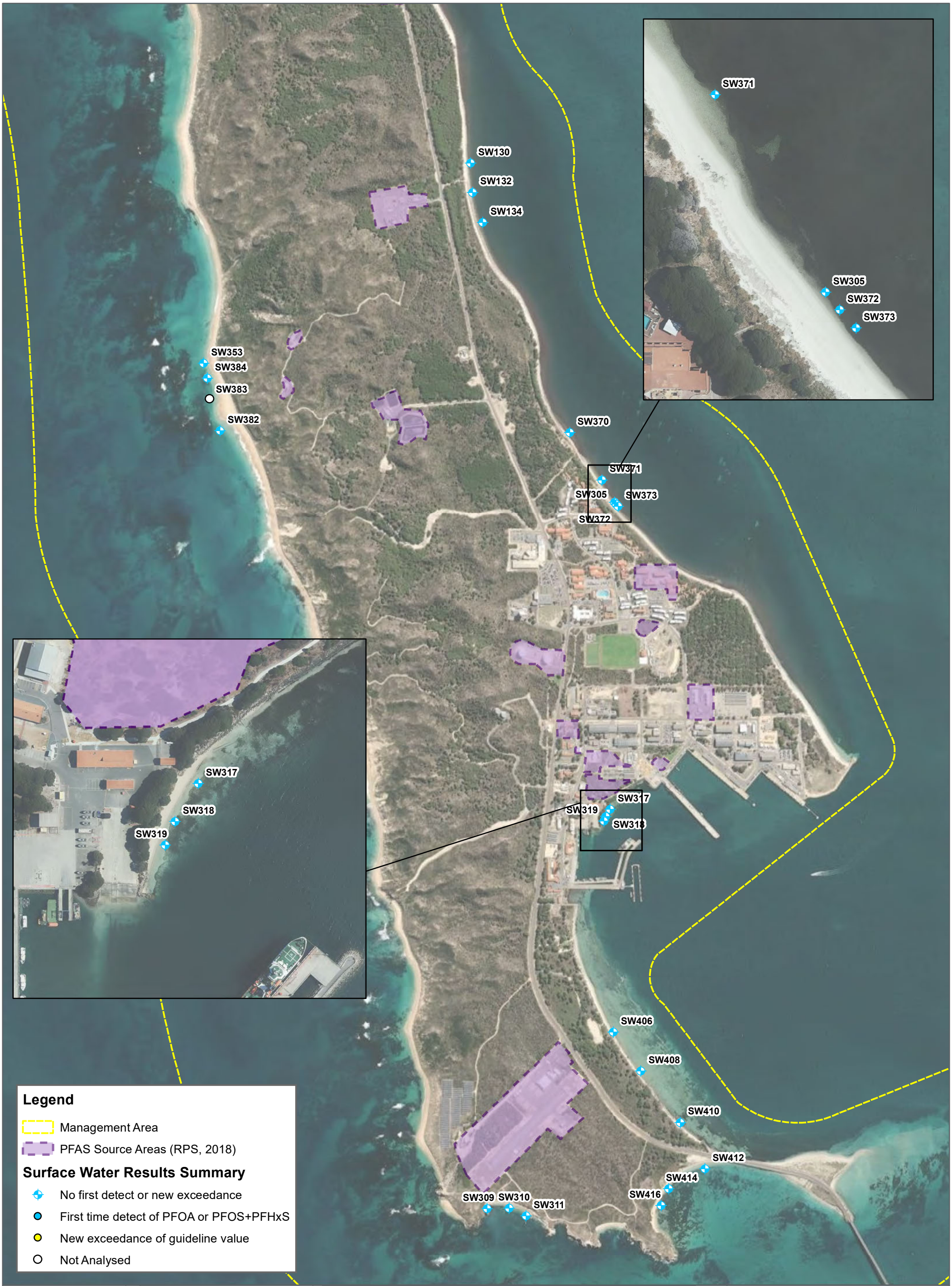
SW371
SW130
SW132
SW134
SW305
SW372
SW373
SW353
SW384
SW383
SW382
SW370
SW371
SW305
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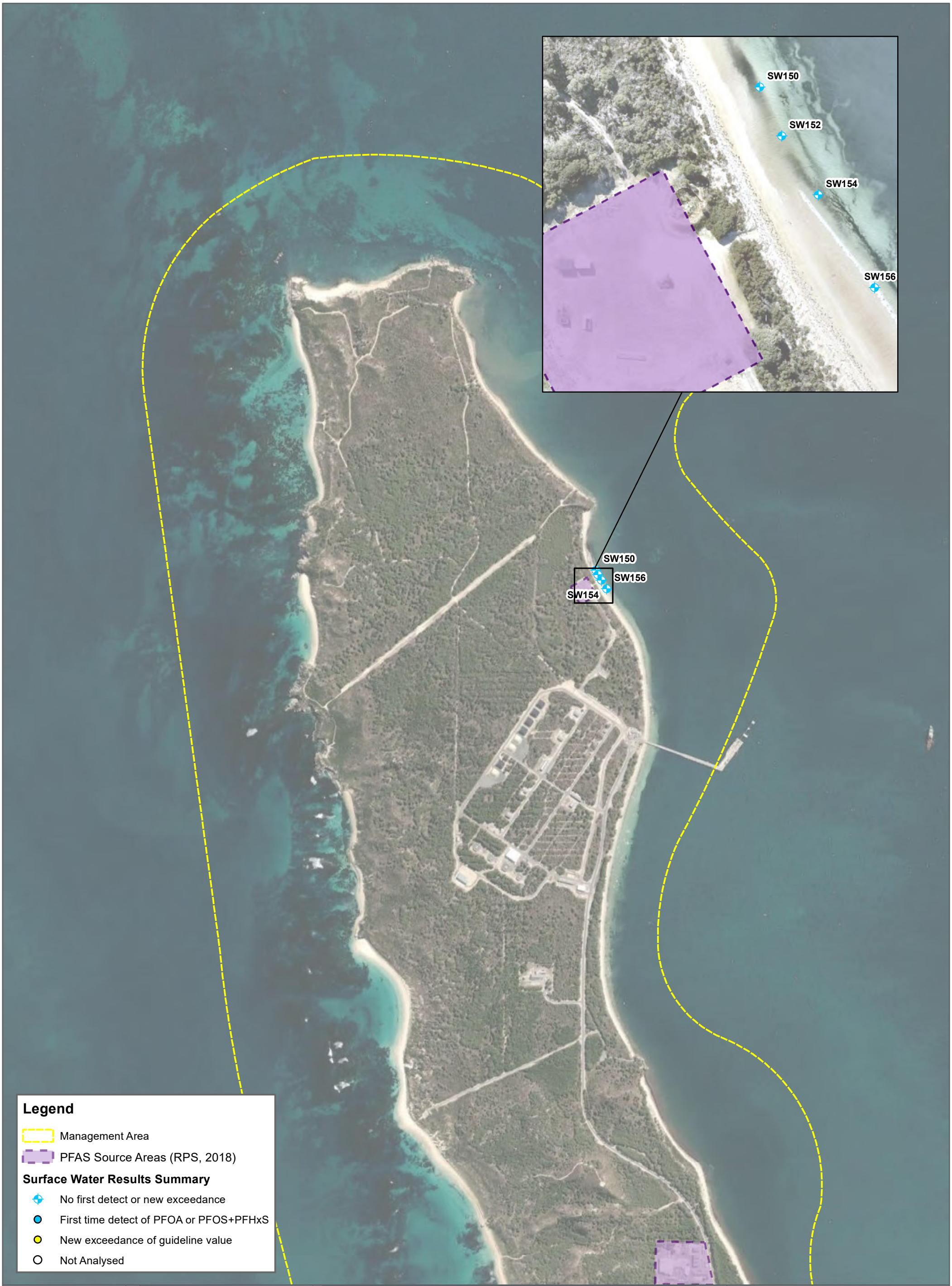
SW372
SW317
SW318
SW319
SW317
SW319
SW318
SW406
SW408
SW410
SW412
SW414
SW416
SW309
SW310
SW311
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Surface Water Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
Not Analysed
FIGURE 3A
1:15,000 Scale at A3
Meters
0
300
600
Surface water Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-04-19 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_2022Q1_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap


SW150
SW152
SW154
SW156
SW150
SW156
SW154
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Surface Water Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
Not Analysed
FIGURE 3B
1:15,000 Scale at A3
Meters
0
300
600
Surface water Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-04-19 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
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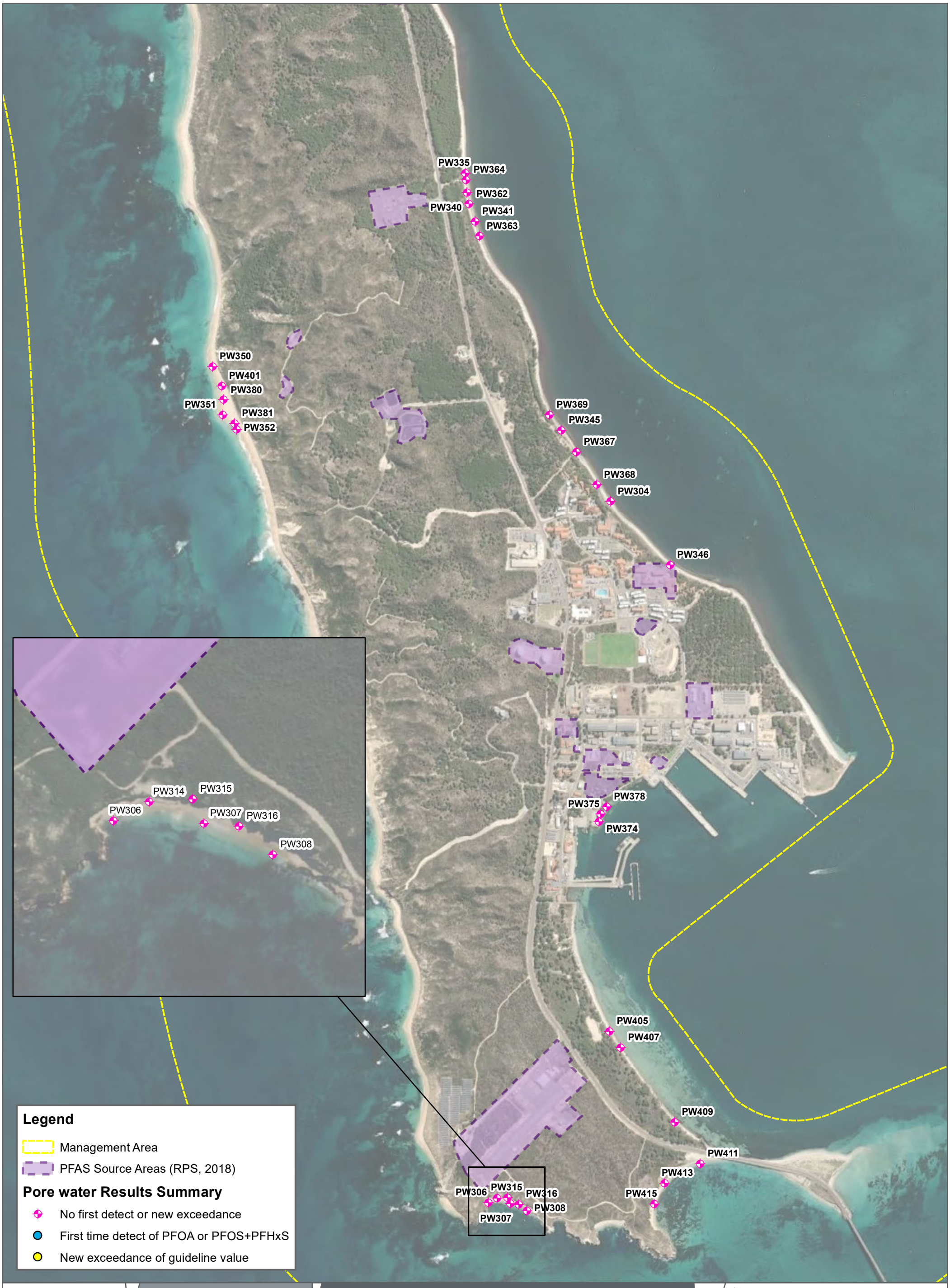
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PW364
PW362
PW340
PW341
PW363
PW350
PW401
PW380
PW351
PW381
PW352
PW369
PW345
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PW368
PW304
PW346
PW314
PW315
PW306
PW307
PW316
PW308
PW378
PW375
PW374
PW405
PW407
PW409
PW411
PW413
PW415
PW306
PW315
PW316
PW308
PW307
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Pore water Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 4A
1:15,000 Scale at A3
Meters
0
300
600
Porewater Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-04-19 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004A_2022Q1_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

PW356
PW331
PW357
PW330
PW358
PW329
PW356
PW358
PW357
PW329

Legend

Management Area

PFAS Source Areas (RPS, 2018)

Pore water Results Summary

No first detect or new exceedance

First time detect of PFOA or PFOS+PFHxS

New exceedance of guideline value

FIGURE 4B

1:15,000 Scale at A3

Meters

0 300 600

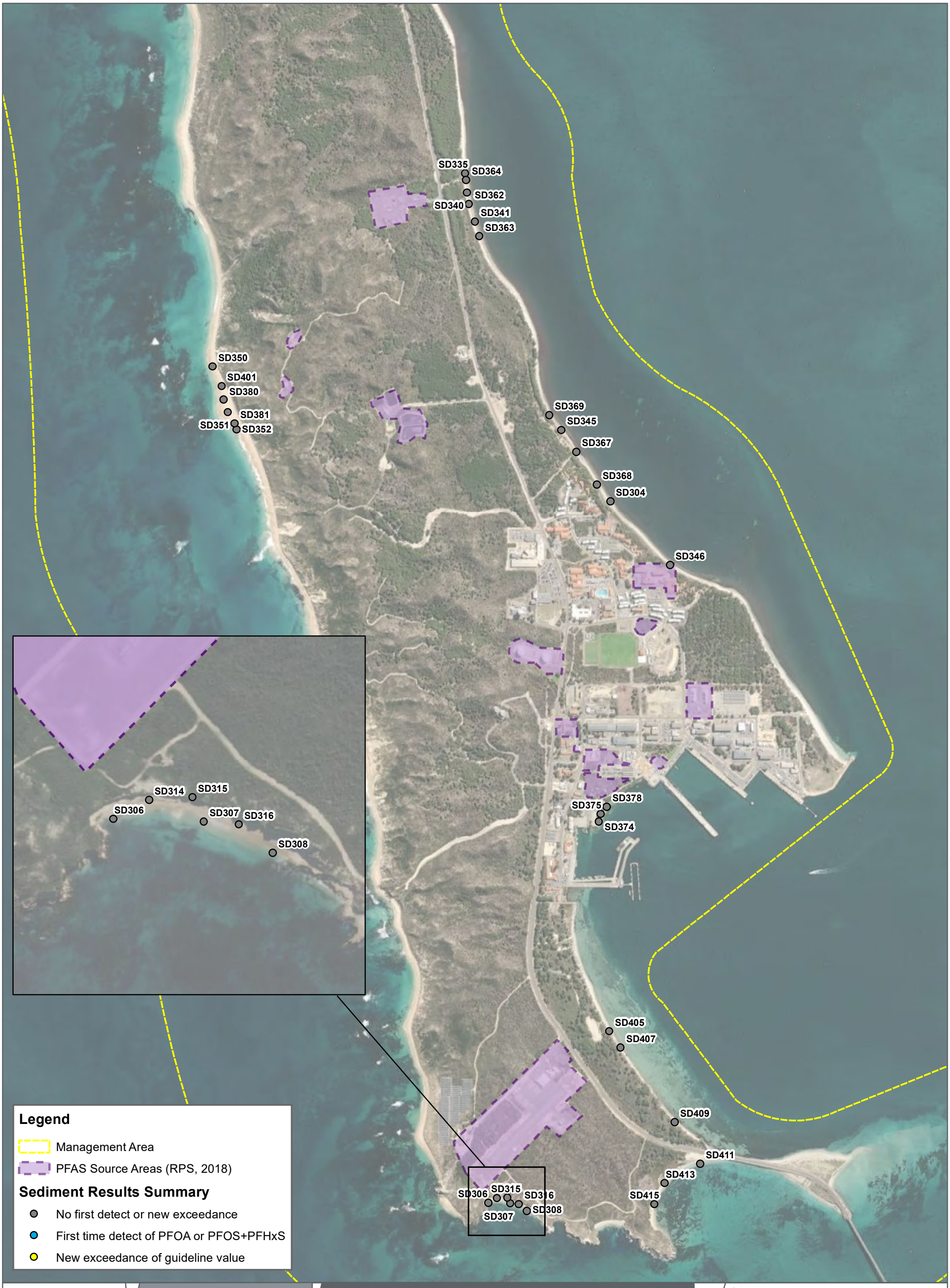
Porewater Results

QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-04-19 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004B_2022Q1_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


SD335
SD364
SD362
SD340
SD341
SD363
SD350
SD401
SD380
SD381
SD351
SD352
SD369
SD345
SD367
SD368
SD304
SD346
SD314
SD315
SD306
SD307
SD316
SD308
SD375
SD378
SD374
SD405
SD407
SD409
SD411
SD413
SD415
SD306
SD315
SD316
SD307
SD308
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sediment Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 5A
1:15,000 Scale at A3
Meters
0
300
600
Sediment Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-04-19 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2022Q1_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth


SD356
SD331
SD357
SD330
SD358
SD329
SD356
SD358
SD357
SD329
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sediment Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 5B
1:15,000 Scale at A3
Meters
0
300
600
Sediment Results
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-04-19 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2022Q1_SDResultSummary_PFAS 01.mxd
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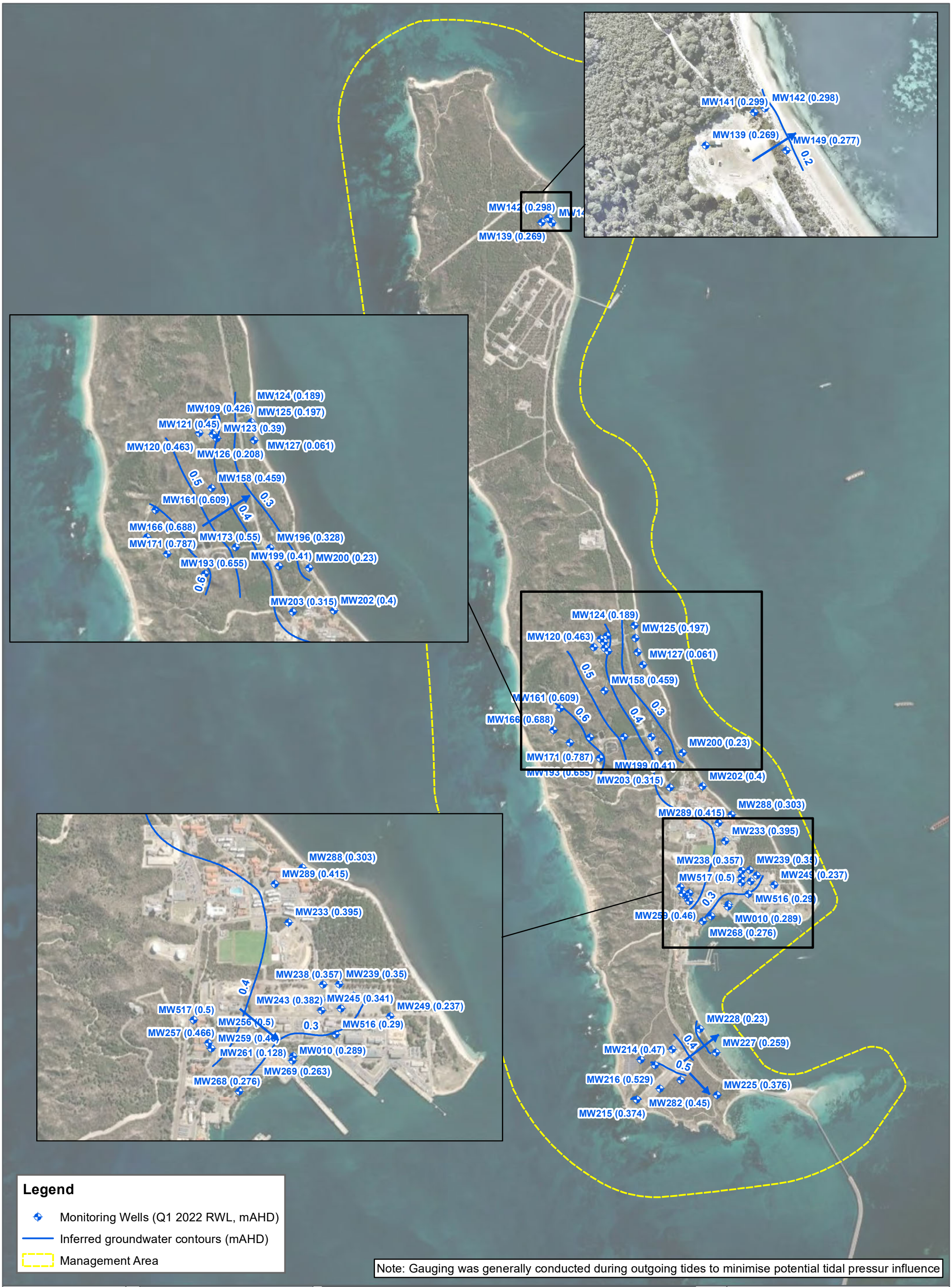
MW142 (0.298)
MW139 (0.269)
MW141 (0.299)
MW149 (0.277)
0.2
MW124 (0.189)
MW109 (0.426)
MW125 (0.197)
MW121 (0.45)
MW123 (0.39)
MW120 (0.463)
MW127 (0.061)
MW126 (0.208)
MW158 (0.459)
MW161 (0.609)
MW166 (0.688)
MW171 (0.787)
MW173 (0.55)
MW196 (0.328)
MW199 (0.41)
MW200 (0.23)
MW193 (0.655)
MW203 (0.315)
MW202 (0.4)
0.5
0.3
0.4
0.6
MW288 (0.303)
MW289 (0.415)
MW233 (0.395)
MW238 (0.357)
MW239 (0.35)
MW243 (0.382)
MW245 (0.341)
MW249 (0.237)
MW517 (0.5)
MW256 (0.5)
MW257 (0.466)
MW259 (0.46)
MW261 (0.128)
MW010 (0.289)
MW269 (0.263)
MW268 (0.276)
MW516 (0.29)
MW228 (0.23)
MW227 (0.259)
MW214 (0.47)
MW216 (0.529)
MW225 (0.376)
MW282 (0.45)
MW215 (0.374)
Legend
Monitoring Wells (Q1 2022 RWL, mAHD)
Inferred groundwater contours (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressur influence
FIGURE 6
1:32,000 Scale at A3
Meters
0
500
1,000
Inferred Groundwater Contours
QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-07-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2022Q1_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorotetradecanoic acid (PFTeDA)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.05
PFAS NEMP 2020 Drinking Water															*0.56*					
PFAS NEMP 2020 Interim Marine 99%									0.00023						19					
PFAS NEMP 2020 Recreational Water															**10**					
Site ID	**Location Code**	**Field ID**	**Date**	**Lab Report No.**																
0089	**MW010**	**0089_MW010_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	0.20	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW109**	**0089_MW109_220314**	**14/03/2022**	**EP2202975**	0.22	0.68	6.84	0.42	3.42	<0.02	0.1	1.41	0.19	0.12	0.38	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW112**	**0089_MW112_220314**	**14/03/2022**	**EP2202975**	0.11	0.50	12.2	2.58	44.8	<0.02	0.1	1.68	0.29	0.59	*1.67*	<0.02	<0.02	0.08	<0.02	<0.05
0089	**MW120**	**0089_MW120_220314**	**14/03/2022**	**EP2202975**	0.02	0.06	6.94	2.40	1.21	<0.02	<0.1	0.13	<0.02	<0.02	*1.59*	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW121**	**0089_MW121_220314**	**14/03/2022**	**EP2202975**	<0.02	<0.02	0.16	0.03	0.33	<0.02	<0.1	0.04	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW123**	**0089_MW123_220314**	**14/03/2022**	**EP2202975**	0.31	0.22	0.70	<0.02	0.06	<0.02	0.1	0.84	0.17	0.04	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW124**	**0089_MW124_220314**	**14/03/2022**	**EP2202976**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW125**	**0089_MW125_220314**	**14/03/2022**	**EP2202976**	0.17	0.18	0.72	<0.02	<0.01	<0.02	<0.1	0.22	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW126**	**0089_MW126_220314**	**14/03/2022**	**EP2202976**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW127**	**0089_MW127_220314**	**14/03/2022**	**EP2202976**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW139**	**0089_MW139_220315**	**15/03/2022**	**EP2203018**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW141**	**0089_MW141_220315**	**15/03/2022**	**EP2203018**	0.97	2.15	30.8	2.10	81.2	<0.02	0.4	19.0	1.58	0.81	*3.17*	<0.02	<0.02	0.03	<0.02	<0.05
0089	**MW142**	**0089_MW142_220315**	**15/03/2022**	**EP2203018**	0.04	0.07	1.93	0.08	2.59	<0.02	<0.1	1.26	0.12	0.03	0.18	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW149**	**0089_MW149_220315**	**15/03/2022**	**EP2203018**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW158**	**0089_MW158_220315**	**15/03/2022**	**EP2203018**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW161**	**0089_MW161_220315**	**15/03/2022**	**EP2203018**	0.03	0.02	0.35	0.07	4.08	<0.02	<0.1	0.20	0.20	0.10	0.06	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW166**	**0089_MW166_220315**	**15/03/2022**	**EP2203018**	0.04	0.06	1.02	0.22	6.79	<0.02	0.1	0.50	0.38	0.20	0.12	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW171**	**0089_MW171_220315**	**15/03/2022**	**EP2203018**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW173**	**0089_MW173_220315**	**15/03/2022**	**EP2203018**	0.35	0.28	4.21	0.51	5.42	<0.02	<0.1	0.88	0.18	0.15	0.45	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW193**	**0089_MW193_220315**	**15/03/2022**	**EP2203018**	1.11	1.42	11.9	0.52	1.86	<0.02	0.2	3.19	0.46	0.24	*0.74*	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW195D**	**0089_MW195D_220315**	**15/03/2022**	**EP2203018**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	0.04	0.04	0.04	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW195S**	**0089_MW195S_220315**	**15/03/2022**	**EP2203018**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW196**	**0089_MW196_220314**	**14/03/2022**	**EP2202975**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW199**	**0089_MW199_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW200**	**0089_MW200_220314**	**14/03/2022**	**EP2202976**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW202**	**0089_MW202_220318**	**18/03/2022**	**EP2203194**	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW203**	**0089_MW203_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW214**	**0089_MW214_220316**	**16/03/2022**	**EP2203057**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW215**	**0089_MW215_220316**	**16/03/2022**	**EP2203057**	0.16	0.12	0.61	<0.02	<0.01	<0.02	<0.1	0.42	0.10	0.03	0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW216**	**0089_MW216_220316**	**16/03/2022**	**EP2203057**	0.53	0.69	3.65	0.15	0.86	<0.02	0.9	3.16	3.66	0.45	0.41	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW217**	**0089_MW217_220317**	**17/03/2022**	**EP2203138**	0.05	0.03	0.02	<0.02	0.09	<0.02	1.7	13.2	8.38	0.92	0.43	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW224**	**0089_MW224_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW225**	**0089_MW225_220316**	**16/03/2022**	**EP2203057**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW226**	**0089_MW226_220316**	**16/03/2022**	**EP2203057**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW227**	**0089_MW227_220316**	**16/03/2022**	**EP2203057**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW228**	**0089_MW228_220316**	**16/03/2022**	**EP2203057**	0.21	0.10	0.15	<0.02	<0.01	<0.02	2.1	10.8	8.23	2.38	0.05	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW233**	**0089_MW233_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	0.01	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW238**	**0089_MW238_220318**	**18/03/2022**	**EP2203194**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW239**	**0089_MW239_220318**	**18/03/2022**	**EP2203194**	<0.02	0.03	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW240**	**0089_MW240_220318**	**18/03/2022**	**EP2203194**	<0.02	<0.02	1.07	<0.02	<0.01	<0.02	<0.1	0.08	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW242**	**0089_MW242_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW243**	**0089_MW243_220318**	**18/03/2022**	**EP2203194**	<0.02	<0.02	0.04	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW245**	**0089_MW245_220318**	**18/03/2022**	**EP2203194**	<0.02	<0.02	0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW249**	**0089_MW249_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	0.07	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW255**	**0089_MW255_220317**	**17/03/2022**	**EP2203138**	0.11	0.06	0.55	<0.02	0.32	<0.02	<0.1	0.23	0.04	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW256**	**0089_MW256_220317**	**17/03/2022**	**EP2203138**	3.22	1.54	10.7	0.55	10.7	0.02	1.1	5.22	1.47	0.41	*0.72*	<0.02	<0.02	0.02	<0.02	<0.05
0089	**MW257**	**0089_MW257_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	0.06	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW259**	**0089_MW259_220317**	**17/03/2022**	**EP2203138**	0.02	0.02	0.08	<0.02	0.18	<0.02	0.1	0.44	0.54	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW261**	**0089_MW261_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW268**	**0089_MW268_220317**	**17/03/2022**	**EP2203138**	0.07	0.06	0.33	<0.02	0.02	<0.02	<0.1	0.05	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW269**	**0089_MW269_220317**	**17/03/2022**	**EP2203138**	0.06	0.10	0.52	<0.02	0.56	<0.02	<0.1	0.14	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW282**	**0089_MW282_220317**	**17/03/2022**	**EP2203138**	3.02	6.09	63.0	9.56	76.9	<0.02	1.0	12.6	1.83	2.81	***12.0***	<0.02	<0.02	0.04	<0.02	<0.05
0089	**MW288**	**0089_MW288_220318**	**18/03/2022**	**EP2203194**	<0.02	<0.02	0.05	<0.02	3.18	<0.02	<0.1	0.03	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW289**	**0089_MW289_220317**	**17/03/2022**	**EP2203138**	0.11	0.08	0.49	0.02	0.36	<0.02	<0.1	0.20	0.06	0.04	0.05	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW500**	**0089_MW500_220314**	**14/03/2022**	**EP2202975**	0.26	0.63	11.4	2.91	45.3	<0.02	0.2	3.23	0.43	0.37	*1.40*	<0.02	<0.02	0.02	<0.02	<0.05
0089	**MW516**	**0089_MW516_220317**	**17/03/2022**	**EP2203138**	0.10	0.04	0.84	0.11	8.54	<0.02	<0.1	0.11	0.11	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.05
0089	**MW517**	**0089_MW517_220317**	**17/03/2022**	**EP2203138**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)_	Sum of PFAS
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																*0.07*		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																**2**		
Site ID	**Location Code**	**Field ID**	**Date**	**Lab Report No.**														
0089	**MW010**	**0089_MW010_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.25***	0.25	0.25
0089	**MW109**	**0089_MW109_220314**	**14/03/2022**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.3***	12.7	13.8
0089	**MW112**	**0089_MW112_220314**	**14/03/2022**	**EP2202975**	<0.05	0.12	<0.05	<0.05	0.49	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***57.0***	61.6	65.2
0089	**MW120**	**0089_MW120_220314**	**14/03/2022**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.15***	9.89	12.4
0089	**MW121**	**0089_MW121_220314**	**14/03/2022**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.49***	0.57	0.60
0089	**MW123**	**0089_MW123_220314**	**14/03/2022**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.76***	2.22	2.44
0089	**MW124**	**0089_MW124_220314**	**14/03/2022**	**EP2202976**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
0089	**MW125**	**0089_MW125_220314**	**14/03/2022**	**EP2202976**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.72***	1.14	1.32
0089	**MW126**	**0089_MW126_220314**	**14/03/2022**	**EP2202976**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW127**	**0089_MW127_220314**	**14/03/2022**	**EP2202976**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW139**	**0089_MW139_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW141**	**0089_MW141_220315**	**15/03/2022**	**EP2203018**	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***112***	138	142
0089	**MW142**	**0089_MW142_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.52***	6.15	6.30
0089	**MW149**	**0089_MW149_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW158**	**0089_MW158_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW161**	**0089_MW161_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.43***	5.02	5.11
0089	**MW166**	**0089_MW166_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.81***	9.15	9.43
0089	**MW171**	**0089_MW171_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.05	0.05
0089	**MW173**	**0089_MW173_220315**	**15/03/2022**	**EP2203018**	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.63***	11.7	12.5
0089	**MW193**	**0089_MW193_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.8***	19.7	21.6
0089	**MW195D**	**0089_MW195D_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.14	0.14
0089	**MW195S**	**0089_MW195S_220315**	**15/03/2022**	**EP2203018**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW196**	**0089_MW196_220314**	**14/03/2022**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW199**	**0089_MW199_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW200**	**0089_MW200_220314**	**14/03/2022**	**EP2202976**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW202**	**0089_MW202_220318**	**18/03/2022**	**EP2203194**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
0089	**MW203**	**0089_MW203_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
0089	**MW214**	**0089_MW214_220316**	**16/03/2022**	**EP2203057**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW215**	**0089_MW215_220316**	**16/03/2022**	**EP2203057**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.61***	1.33	1.45
0089	**MW216**	**0089_MW216_220316**	**16/03/2022**	**EP2203057**	<0.05	2.91	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.51***	16.5	17.4
0089	**MW217**	**0089_MW217_220317**	**17/03/2022**	**EP2203138**	<0.05	27.2	0.48	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.11***	52.5	52.5
0089	**MW224**	**0089_MW224_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.08***	0.08	0.08
0089	**MW225**	**0089_MW225_220316**	**16/03/2022**	**EP2203057**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW226**	**0089_MW226_220316**	**16/03/2022**	**EP2203057**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
0089	**MW227**	**0089_MW227_220316**	**16/03/2022**	**EP2203057**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**MW228**	**0089_MW228_220316**	**16/03/2022**	**EP2203057**	<0.05	0.23	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.15***	24.2	24.2
0089	**MW233**	**0089_MW233_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.25***	0.25	0.25
0089	**MW238**	**0089_MW238_220318**	**18/03/2022**	**EP2203194**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
0089	**MW239**	**0089_MW239_220318**	**18/03/2022**	**EP2203194**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.05
0089	**MW240**	**0089_MW240_220318**	**18/03/2022**	**EP2203194**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***1.07***	1.16	1.16
0089	**MW242**	**0089_MW242_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
0089	**MW243**	**0089_MW243_220318**	**18/03/2022**	**EP2203194**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
0089	**MW245**	**0089_MW245_220318**	**18/03/2022**	**EP2203194**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.08***	0.08	0.08
0089	**MW249**	**0089_MW249_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.10***	0.10	0.10
0089	**MW255**	**0089_MW255_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.87***	1.26	1.32
0089	**MW256**	**0089_MW256_220317**	**17/03/2022**	**EP2203138**	<0.05	0.23	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***21.4***	33.8	36.0
0089	**MW257**	**0089_MW257_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.08***	0.08	0.08
0089	**MW259**	**0089_MW259_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.26***	1.36	1.38
0089	**MW261**	**0089_MW261_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
0089	**MW268**	**0089_MW268_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.35***	0.47	0.53
0089	**MW269**	**0089_MW269_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***1.08***	1.31	1.41
0089	**MW282**	**0089_MW282_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***140***	173	189
0089	**MW288**	**0089_MW288_220318**	**18/03/2022**	**EP2203194**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.23***	3.26	3.26
0089	**MW289**	**0089_MW289_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.85***	1.31	1.41
0089	**MW500**	**0089_MW500_220314**	**14/03/2022**	**EP2202975**	<0.05	0.10	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***56.7***	62.7	66.2
0089	**MW516**	**0089_MW516_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.38***	9.77	9.92
0089	**MW517**	**0089_MW517_220317**	**17/03/2022**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids									
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02
PFAS NEMP 2020 Drinking Water											*0.56*					
PFAS NEMP 2020 Interim Marine 99%					0.00023						19					
PFAS NEMP 2020 Recreational Water											**10**					
Site ID	**Location Code**	**Field ID**	**Date**	**Lab Report No.**												
0089	**PW304**	**0089_PW304_220318**	**18/03/2022**	**EP2203195**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW306**	**0089_PW306_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW307**	**0089_PW307_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW308**	**0089_PW308_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW314**	**0089_PW314_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW315**	**0089_PW315_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW316**	**0089_PW316_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW329**	**0089_PW329_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW330**	**0089_PW330_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW331**	**0089_PW331_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW335**	**0089_PW335_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW340**	**0089_PW340_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW341**	**0089_PW341_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW345**	**0089_PW345_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.19	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW346**	**0089_PW346_220318**	**18/03/2022**	**EP2203195**	0.04	0.06	0.64	<0.02	1.12	<0.02	<0.1	0.08	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW350**	**0089_PW350_220314**	**14/03/2022**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW351**	**0089_PW351_220314**	**14/03/2022**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW352**	**0089_PW352_220314**	**14/03/2022**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW356**	**0089_PW356_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW357**	**0089_PW357_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW358**	**0089_PW358_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW362**	**0089_PW362_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW363**	**0089_PW363_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW364**	**0089_PW364_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW367**	**0089_PW367_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW368**	**0089_PW368_220318**	**18/03/2022**	**EP2203195**	<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW369**	**0089_PW369_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW374**	**0089_PW374_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW375**	**0089_PW375_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW378**	**0089_PW378_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW380**	**0089_PW380_220314**	**14/03/2022**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW381**	**0089_PW381_220314**	**14/03/2022**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW401**	**0089_PW401_220314**	**14/03/2022**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW405**	**0089_PW405_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.05	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW407**	**0089_PW407_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW409**	**0089_PW409_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW411**	**0089_PW411_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW413**	**0089_PW413_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**PW415**	**0089_PW415_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

					PFAS - (n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)_	Sum of PFAS
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Site ID	**Location Code**	**Field ID**	**Date**	**Lab Report No.**															
0089	**PW304**	**0089_PW304_220318**	**18/03/2022**	**EP2203195**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
0089	**PW306**	**0089_PW306_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW307**	**0089_PW307_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW308**	**0089_PW308_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW314**	**0089_PW314_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW315**	**0089_PW315_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW316**	**0089_PW316_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW329**	**0089_PW329_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW330**	**0089_PW330_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW331**	**0089_PW331_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
0089	**PW335**	**0089_PW335_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
0089	**PW340**	**0089_PW340_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
0089	**PW341**	**0089_PW341_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
0089	**PW345**	**0089_PW345_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.19*	0.19	0.19
0089	**PW346**	**0089_PW346_220318**	**18/03/2022**	**EP2203195**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.76*	1.88	1.94
0089	**PW350**	**0089_PW350_220314**	**14/03/2022**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
0089	**PW351**	**0089_PW351_220314**	**14/03/2022**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW352**	**0089_PW352_220314**	**14/03/2022**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW356**	**0089_PW356_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW357**	**0089_PW357_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW358**	**0089_PW358_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW362**	**0089_PW362_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
0089	**PW363**	**0089_PW363_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06
0089	**PW364**	**0089_PW364_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
0089	**PW367**	**0089_PW367_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
0089	**PW368**	**0089_PW368_220318**	**18/03/2022**	**EP2203195**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
0089	**PW369**	**0089_PW369_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
0089	**PW374**	**0089_PW374_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW375**	**0089_PW375_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
0089	**PW378**	**0089_PW378_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW380**	**0089_PW380_220314**	**14/03/2022**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW381**	**0089_PW381_220314**	**14/03/2022**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW401**	**0089_PW401_220314**	**14/03/2022**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
0089	**PW405**	**0089_PW405_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.08	0.08
0089	**PW407**	**0089_PW407_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW409**	**0089_PW409_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW411**	**0089_PW411_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW413**	**0089_PW413_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**PW415**	**0089_PW415_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids									
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02
PFAS NEMP 2020 Drinking Water											*0.56*					
PFAS NEMP 2020 Interim Marine 99%					0.00023						19					
PFAS NEMP 2020 Recreational Water											**10**					
Site ID	**Location Code**	**Field ID**	**Date**	**Lab Report No.**												
0089	**SW130**	**0089_SW130_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW132**	**0089_SW132_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW134**	**0089_SW134_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW150**	**0089_SW150_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW152**	**0089_SW152_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW154**	**0089_SW154_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW156**	**0089_SW156_220315**	**15/03/2022**	**EP2203019**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW305**	**0089_SW305_220318**	**18/03/2022**	**EP2203195**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW309**	**0089_SW309_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW310**	**0089_SW310_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW311**	**0089_SW311_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW317**	**0089_SW317_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW318**	**0089_SW318_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW319**	**0089_SW319_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW353**	**0089_SW353_220314**	**14/03/2022**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW370**	**0089_SW370_220314**	**14/03/2022**	**EP2202977**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW371**	**0089_SW371_220318**	**18/03/2022**	**EP2203195**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW372**	**0089_SW372_220318**	**18/03/2022**	**EP2203195**	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW373**	**0089_SW373_220318**	**18/03/2022**	**EP2203195**	<0.02	<0.02	0.02	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW382**	**0089_SW382_220314**	**14/03/2022**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW384**	**0089_SW384_220314**	**14/03/2022**	**EP2202980**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW406**	**0089_SW406_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW408**	**0089_SW408_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW410**	**0089_SW410_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW412**	**0089_SW412_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW414**	**0089_SW414_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02
0089	**SW416**	**0089_SW416_220316**	**16/03/2022**	**EP2203058**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Notes:

First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

					PFAS - (n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)_	Sum of PFAS
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Site ID	**Location Code**	**Field ID**	**Date**	**Lab Report No.**															
0089	**SW130**	**0089_SW130_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW132**	**0089_SW132_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW134**	**0089_SW134_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW150**	**0089_SW150_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW152**	**0089_SW152_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW154**	**0089_SW154_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW156**	**0089_SW156_220315**	**15/03/2022**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW305**	**0089_SW305_220318**	**18/03/2022**	**EP2203195**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW309**	**0089_SW309_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW310**	**0089_SW310_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW311**	**0089_SW311_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW317**	**0089_SW317_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW318**	**0089_SW318_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW319**	**0089_SW319_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW353**	**0089_SW353_220314**	**14/03/2022**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW370**	**0089_SW370_220314**	**14/03/2022**	**EP2202977**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
0089	**SW371**	**0089_SW371_220318**	**18/03/2022**	**EP2203195**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW372**	**0089_SW372_220318**	**18/03/2022**	**EP2203195**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
0089	**SW373**	**0089_SW373_220318**	**18/03/2022**	**EP2203195**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.12*	0.12	0.12
0089	**SW382**	**0089_SW382_220314**	**14/03/2022**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW384**	**0089_SW384_220314**	**14/03/2022**	**EP2202980**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW406**	**0089_SW406_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW408**	**0089_SW408_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW410**	**0089_SW410_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW412**	**0089_SW412_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW414**	**0089_SW414_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
0089	**SW416**	**0089_SW416_220316**	**16/03/2022**	**EP2203058**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids									
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2020 Ecological direct exposure					1						10					
PFAS NEMP 2020 Ecological indirect exposure					*0.01*											
PFAS NEMP 2020 Industrial/ commercial (HIL D)											**50**					
Site ID	**Location Code**	**Field ID**	**Date**	**Lab Report No.**																
0089	**SD304**	**0089_SD304_220318**	**18/03/2022**	**EP2203196**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD306**	**0089_SD306_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD307**	**0089_SD307_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD308**	**0089_SD308_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD314**	**0089_SD314_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD315**	**0089_SD315_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD316**	**0089_SD316_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD329**	**0089_SD329_220315**	**15/03/2022**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD330**	**0089_SD330_220315**	**15/03/2022**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD331**	**0089_SD331_220315**	**15/03/2022**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD335**	**0089_SD335_220314**	**14/03/2022**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD340**	**0089_SD340_220314**	**14/03/2022**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD341**	**0089_SD341_220314**	**14/03/2022**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD345**	**0089_SD345_220314**	**14/03/2022**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD346**	**0089_SD346_220318**	**18/03/2022**	**EP2203196**	<0.0002	<0.0002	0.0024	<0.0002	*0.0153*	<0.0002	<0.001	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD350**	**0089_SD350_220314**	**14/03/2022**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD351**	**0089_SD351_220314**	**14/03/2022**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD352**	**0089_SD352_220314**	**14/03/2022**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD356**	**0089_SD356_220315**	**15/03/2022**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD357**	**0089_SD357_220315**	**15/03/2022**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD358**	**0089_SD358_220315**	**15/03/2022**	**EP2203020**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD362**	**0089_SD362_220314**	**14/03/2022**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD363**	**0089_SD363_220314**	**14/03/2022**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD364**	**0089_SD364_220314**	**14/03/2022**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD367**	**0089_SD367_220314**	**14/03/2022**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD368**	**0089_SD368_220318**	**18/03/2022**	**EP2203196**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD369**	**0089_SD369_220314**	**14/03/2022**	**EP2202978**	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD374**	**0089_SD374_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD375**	**0089_SD375_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD378**	**0089_SD378_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD380**	**0089_SD380_220314**	**14/03/2022**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD381**	**0089_SD381_220314**	**14/03/2022**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD401**	**0089_SD401_220314**	**14/03/2022**	**EP2202979**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD405**	**0089_SD405_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD407**	**0089_SD407_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD409**	**0089_SD409_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD411**	**0089_SD411_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD413**	**0089_SD413_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0089	**SD415**	**0089_SD415_220316**	**16/03/2022**	**EP2203059**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

					PFAS - (n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)_	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
PFAS NEMP 2020 Ecological direct exposure																			
PFAS NEMP 2020 Ecological indirect exposure																			
PFAS NEMP 2020 Industrial/ commercial (HIL D)																	**20**		
Site ID	**Location Code**	**Field ID**	**Date**	**Lab Report No.**															
0089	**SD304**	**0089_SD304_220318**	**18/03/2022**	**EP2203196**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0177	0.0179	0.0179
0089	**SD306**	**0089_SD306_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
0089	**SD307**	**0089_SD307_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD308**	**0089_SD308_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD314**	**0089_SD314_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD315**	**0089_SD315_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD316**	**0089_SD316_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD329**	**0089_SD329_220315**	**15/03/2022**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD330**	**0089_SD330_220315**	**15/03/2022**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD331**	**0089_SD331_220315**	**15/03/2022**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD335**	**0089_SD335_220314**	**14/03/2022**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD340**	**0089_SD340_220314**	**14/03/2022**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD341**	**0089_SD341_220314**	**14/03/2022**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD345**	**0089_SD345_220314**	**14/03/2022**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD346**	**0089_SD346_220318**	**18/03/2022**	**EP2203196**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0177	0.0179	0.0179
0089	**SD350**	**0089_SD350_220314**	**14/03/2022**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
0089	**SD351**	**0089_SD351_220314**	**14/03/2022**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD352**	**0089_SD352_220314**	**14/03/2022**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD356**	**0089_SD356_220315**	**15/03/2022**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD357**	**0089_SD357_220315**	**15/03/2022**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD358**	**0089_SD358_220315**	**15/03/2022**	**EP2203020**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD362**	**0089_SD362_220314**	**14/03/2022**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD363**	**0089_SD363_220314**	**14/03/2022**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD364**	**0089_SD364_220314**	**14/03/2022**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD367**	**0089_SD367_220314**	**14/03/2022**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
0089	**SD368**	**0089_SD368_220318**	**18/03/2022**	**EP2203196**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD369**	**0089_SD369_220314**	**14/03/2022**	**EP2202978**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
0089	**SD374**	**0089_SD374_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD375**	**0089_SD375_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD378**	**0089_SD378_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD380**	**0089_SD380_220314**	**14/03/2022**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD381**	**0089_SD381_220314**	**14/03/2022**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD401**	**0089_SD401_220314**	**14/03/2022**	**EP2202979**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD405**	**0089_SD405_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD407**	**0089_SD407_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD409**	**0089_SD409_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD411**	**0089_SD411_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD413**	**0089_SD413_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0089	**SD415**	**0089_SD415_220316**	**16/03/2022**	**EP2203059**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

Field ID			0089_PW364_220314	0089_QC101_220314		0089_PW364_220314	0089_QC201_220314		0089_MW125_220314	0089_QC103_220314		0089_MW125_220314	0089_QC203_220314		0089_MW121_220314	0089_QC102_220314	
Date			14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2202977	EP2202977	RPD	EP2202977	872911	RPD	EP2202976	EP2202976	RPD	EP2202976	872911	RPD	EP2202975	EP2202975	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01					<0.01						0.05				
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.17	0.17	0	0.17	0.14	19	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.18	0.19	5	0.18	0.14	25	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.72	0.79	9	0.72	0.66	9	0.16	0.16	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.03	0.03	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.02	0.05	86	0.02	<0.01	67	<0.01	<0.01	0	<0.01	<0.01	0	0.33	0.43	26
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01				
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.03	0.03	0	0.03	0.03	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.22	0.23	4	0.22	0.15	38	0.04	0.05	22
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.04	0.05	22
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	0.02	0.05	86	0.02	<0.01	67	0.72	0.79	9	0.72	0.66	9	0.49	0.59	19
Sum of PFAS (WA DER List)	µg/L	0.01	0.02	0.05	86	0.02	<0.05	0	1.14	1.22	7	1.14	0.98	15	0.57	0.69	19
Sum of PFAS	µg/L	0.01	0.02	0.05	86	0.02	<0.1	0	1.32	1.41	7	1.32	1.17	12	0.60	0.72	18
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01					<0.01						0.66				
Sum of PFAS (PFOS + PFOA)	µg/L	0.01					<0.01						<0.01				
Inorganics																	
Carbonate Alkalinity (as CaCO3)	mg/L	1	<1	<1	0	<1			<1	<1	0	<1			<1		
Alkalinity (Bicarbonate as CaCO3)	mg/L	1	122	121	1	122			417	415	0	417			270		
Alkalinity (Hydroxide) as CaCO3	mg/L	1	<1	<1	0	<1			<1	<1	0	<1			<1		
Alkalinity (total) as CaCO3	mg/L	1	122	121	1	122			417	415	0	417			270		
Anions Total	meq/L	0.01	636	633	0	636			504	486	4	504			6.28		
Cations Total	meq/L	0.01	716	698	3	716			504	519	3	504			5.56		
Chloride	mg/L	1	20,600	20,300	1	20,600			16,100	15,500	4	16,100			24		
Ionic Balance	%	0.01	5.92	4.93	18	5.92			0.04	3.21	195	0.04			6.03		
Sulphate as SO4 - Turbidimetric (filtered)	mg/L	1	2,510	2,770	10	2,510			2,000	1,960	2	2,000			10		
Metals																	
Calcium (filtered)	mg/L	1	507	494	3	507			473	497	5	473			76		
Magnesium (filtered)	mg/L	1	1,630	1,590	2	1,630			1,210	1,240	2	1,210			13		
Potassium (filtered)	mg/L	1	667	644	4	667			439	453	3	439			2		
Sodium (filtered)	mg/L	1	12,400	12,100	2	12,400			8,490	8,740	3	8,490			15		

**RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Field ID			0089_MW121_220314	0089_QC202_220314		0089_MW120_220314	0089_QC104_220314		0089_MW120_220314	0089_QC204_220314		0089_MW112_220314	0089_QC105_220314		0089_MW112_220314	0089_QC205_220314	
Date			14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2202975	872911	RPD	EP2202975	EP2202975	RPD	EP2202975	872911	RPD	EP2202975	EP2202975	RPD	EP2202975	872911	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01		<0.01						<0.01						0.02	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	0.02	0.02	0	0.02	0.02	0	0.11	0.10	10	0.11	0.09	20
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	0.06	0.06	0	0.06	0.04	40	0.50	0.34	**38**	0.50	0.23	**74**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.16	<0.01	**176**	6.94	8.05	15	6.94	3.2	**74**	12.2	7.98	**42**	12.2	9.7	**23**
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0.03	<0.01	100	2.40	2.57	7	2.40	0.63	**117**	2.58	2.43	6	2.58	1.2	**73**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.33	0.03	**167**	1.21	1.32	9	1.21	3.3	**93**	44.8	39.7	12	44.8	50	11
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01		<0.01						<0.01						0.11	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	0.1	0.1	0	0.1	0.10	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.02	0	0.29	0.29	0	0.29	0.24	19
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.04	<0.01	120	0.13	0.13	0	0.13	0.10	26	1.68	1.63	3	1.68	1.1	**42**
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.01	0	0.59	0.57	3	0.59	0.41	**36**
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.04	<0.01	120	1.59	1.57	1	1.59	0.37	**124**	1.67	1.57	6	1.67	1.3	**25**
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.08	0.07	13	0.08	0.05	46
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	0.12	0.15	22	0.12	0.14	15
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	0.49	0.47	4	0.49	0.33	**39**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	0.49	0.03	**177**	8.15	9.37	14	8.15	6.5	**23**	57.0	47.7	18	57.0	59.7	5
Sum of PFAS (WA DER List)	µg/L	0.01	0.57	<0.05	**168**	9.89	11.1	12	9.89	7.02	**34**	61.6	52.1	17	61.6	63.08	2
Sum of PFAS	µg/L	0.01	0.60	<0.1	**143**	12.4	13.7	10	12.4	7.69	**47**	65.2	55.4	16	65.2	65.02	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01		0.03						6.87						61	
Sum of PFAS (PFOS + PFOA)	µg/L	0.01		0.03						3.67						51.3	
Inorganics																	
Carbonate Alkalinity (as CaCO3)	mg/L	1	<1			<1			<1			<1			<1		
Alkalinity (Bicarbonate as CaCO3)	mg/L	1	270			232			232			205			205		
Alkalinity (Hydroxide) as CaCO3	mg/L	1	<1			<1			<1			<1			<1		
Alkalinity (total) as CaCO3	mg/L	1	270			232			232			205			205		
Anions Total	meq/L	0.01	6.28			6.26			6.26			5.24			5.24		
Cations Total	meq/L	0.01	5.56			6.46			6.46			5.38			5.38		
Chloride	mg/L	1	24			42			42			28			28		
Ionic Balance	%	0.01	6.03			1.60			1.60			1.36			1.36		
Sulphate as SO4 - Turbidimetric (filtered)	mg/L	1	10			21			21			17			17		
Metals																	
Calcium (filtered)	mg/L	1	76			78			78			73			73		
Magnesium (filtered)	mg/L	1	13			16			16			9			9		
Potassium (filtered)	mg/L	1	2			3			3			<1			<1		
Sodium (filtered)	mg/L	1	15			27			27			23			23		

*RPDs have only been considered where a concentration is greater than 1 times
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs f
***Interlab Duplicates are matched on a per compound basis as methods vary b

Field ID			0089_SW134_220314	0089_QC107_220314		0089_SW134_220314	0089_QC207_220314		0089_MW196_220314	0089_QC108_220314		0089_MW196_220314	0089_QC208_220314		0089_MW109_220314	0089_QC106_220314	
Date			14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2202977	EP2202977	RPD	EP2202977	872911	RPD	EP2202975	EP2202975	RPD	EP2202975	872911	RPD	EP2202975	EP2202975	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01					<0.01						<0.01				
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.22	0.21	5
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.68	0.37	**59**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	6.84	5.61	20
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.42	0.38	10
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	3.42	3.04	12
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01				
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	0.1	0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.19	0.17	11
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	1.41	1.29	9
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.12	0.12	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.38	0.35	8
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	10.3	8.65	17
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0	12.7	10.9	15
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	13.8	11.6	17
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01					<0.01						<0.01				
Sum of PFAS (PFOS + PFOA)	µg/L	0.01					<0.01						<0.01				
Inorganics																	
Carbonate Alkalinity (as CaCO3)	mg/L	1	<1	<1	0	<1			<1			<1			<1		
Alkalinity (Bicarbonate as CaCO3)	mg/L	1	121	122	1	121			226			226			437		
Alkalinity (Hydroxide) as CaCO3	mg/L	1	<1	<1	0	<1			<1			<1			<1		
Alkalinity (total) as CaCO3	mg/L	1	121	122	1	121			226			226			437		
Anions Total	meq/L	0.01	629	636	1	629			5.93			5.93			15.1		
Cations Total	meq/L	0.01	697	674	3	697			6.53			6.53			15.8		
Chloride	mg/L	1	20,200	20,500	1	20,200			31			31			200		
Ionic Balance	%	0.01	5.16	2.92	**55**	5.16			4.83			4.83			2.00		
Sulphate as SO4 - Turbidimetric (filtered)	mg/L	1	2,720	2,650	3	2,720			26			26			37		
Metals																	
Calcium (filtered)	mg/L	1	492	473	4	492			76			76			120		
Magnesium (filtered)	mg/L	1	1,580	1,530	3	1,580			20			20			51		
Potassium (filtered)	mg/L	1	639	616	4	639			2			2			2		
Sodium (filtered)	mg/L	1	12,100	11,700	3	12,100			24			24			127		

***RPDs have only been considered where a concentration is greater than 1 times**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs f**
*****Interlab Duplicates are matched on a per compound basis as methods vary b**

Field ID			0089_MW109_220314	0089_QC206_220314		0089_MW195S_220315	0089_QC111_220315		0089_MW195S_220315	0089_QC211_220315		0089_PW331_220315	0089_QC114_220315		0089_PW331_220315	0089_QC214_220315	
Date			14/03/2022	14/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2202975	872911	RPD	EP2203018	EP2203018	RPD	EP2203018	872903	RPD	EP2203019	EP2203019	RPD	EP2203019	872903	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01		0.03						<0.01						<0.01	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.22	0.18	20	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.68	0.42	47	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	6.84	5.5	22	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0.42	0.24	55	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	3.42	3.1	10	<0.01	<0.01	0	<0.01	<0.01	0	0.01	0.01	0	0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01		<0.01						<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	0.1	0.12	18	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.19	0.12	45	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	1.41	0.86	48	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0.12	0.08	40	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.38	0.30	24	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	10.3	8.6	18	<0.01	<0.01	0	<0.01	<0.01	0	0.01	0.01	0	0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	12.7	10.26	21	<0.01	<0.01	0	<0.01	<0.05	0	0.01	0.01	0	0.01	<0.05	0
Sum of PFAS	µg/L	0.01	13.8	10.95	23	<0.01	<0.01	0	<0.01	<0.1	0	0.01	0.01	0	0.01	<0.1	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01		8.9						<0.01						<0.01	
Sum of PFAS (PFOS + PFOA)	µg/L	0.01		3.4						<0.01						<0.01	
Inorganics																	
Carbonate Alkalinity (as CaCO3)	mg/L	1	<1			<1			<1			<1	<1	0	<1		
Alkalinity (Bicarbonate as CaCO3)	mg/L	1	437			574			574			172	172	0	172		
Alkalinity (Hydroxide) as CaCO3	mg/L	1	<1			<1			<1			<1	<1	0	<1		
Alkalinity (total) as CaCO3	mg/L	1	437			574			574			172	172	0	172		
Anions Total	meq/L	0.01	15.1			47.2			47.2			619	591	5	619		
Cations Total	meq/L	0.01	15.8			47.4			47.4			687	702	2	687		
Chloride	mg/L	1	200			1,040			1,040			19,800	18,800	5	19,800		
Ionic Balance	%	0.01	2.00			0.13			0.13			5.19	8.59	49	5.19		
Sulphate as SO4 - Turbidimetric (filtered)	mg/L	1	37			309			309			2,750	2,750	0	2,750		
Metals																	
Calcium (filtered)	mg/L	1	120			198			198			491	494	1	491		
Magnesium (filtered)	mg/L	1	51			147			147			1,560	1,580	1	1,560		
Potassium (filtered)	mg/L	1	2			47			47			648	656	1	648		
Sodium (filtered)	mg/L	1	127			556			556			11,900	12,200	2	11,900		

*RPDs have only been considered where a concentration is greater than 1 times
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs f
***Interlab Duplicates are matched on a per compound basis as methods vary b

Field ID			0089_SW150_220315	0089_QC117_220315		0089_SW150_220315	0089_QC217_220315		0089_PW357_220315	0089_QC118_220315		0089_PW357_220315	0089_QC218_220315		0089_SW154_220315	0089_QC113_220315	
Date			15/03/2022	15/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2203019	EP2203019	RPD	EP2203019	872903	RPD	EP2203019	EP2203019	RPD	EP2203019	872903	RPD	EP2203019	EP2203019	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01					<0.01						<0.01				
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01				
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01					<0.01						<0.01				
Sum of PFAS (PFOS + PFOA)	µg/L	0.01					<0.01						<0.01				
Inorganics																	
Carbonate Alkalinity (as CaCO3)	mg/L	1	<1	<1	0	<1			<1	<1	0	<1			<1		
Alkalinity (Bicarbonate as CaCO3)	mg/L	1	123	120	2	123			142	134	6	142			119		
Alkalinity (Hydroxide) as CaCO3	mg/L	1	<1	<1	0	<1			<1	<1	0	<1			<1		
Alkalinity (total) as CaCO3	mg/L	1	123	120	2	123			142	134	6	142			119		
Anions Total	meq/L	0.01	587	590	1	587			617	613	1	617			603		
Cations Total	meq/L	0.01	623	691	10	623			669	692	3	669			662		
Chloride	mg/L	1	18,800	18,900	1	18,800			19,900	19,700	1	19,900			19,400		
Ionic Balance	%	0.01	3.02	7.91	**89**	3.02			4.02	6.03	**40**	4.02			4.68		
Sulphate as SO4 - Turbidimetric (filtered)	mg/L	1	2,600	2,600	0	2,600			2,560	2,640	3	2,560			2,580		
Metals																	
Calcium (filtered)	mg/L	1	439	481	9	439			470	487	4	470			461		
Magnesium (filtered)	mg/L	1	1,420	1,560	9	1,420			1,520	1,570	3	1,520			1,500		
Potassium (filtered)	mg/L	1	584	650	11	584			630	651	3	630			622		
Sodium (filtered)	mg/L	1	10,800	12,000	11	10,800			11,600	12,000	3	11,600			11,500		

*RPDs have only been considered where a concentration is greater than 1 times
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs f
***Interlab Duplicates are matched on a per compound basis as methods vary b

Field ID			0089_SW154_220315	0089_QC213_220315		0089_PW329_220315	0089_QC116_220315		0089_PW329_220315	0089_QC216_220315	
Date			15/03/2022	15/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022	
Matrix Type			Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2203019	872903	RPD	EP2203019	EP2203019	RPD	EP2203019	872903	RPD
	Unit	LOR									
PFAS - Perfluoroalkyl Sulfonic Acids											
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01		<0.01						<0.01	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01		<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids											
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids											
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides											
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS											
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.01	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	µg/L	0.01		<0.01						<0.01	
Sum of PFAS (PFOS + PFOA)	µg/L	0.01		<0.01						<0.01	
Inorganics											
Carbonate Alkalinity (as CaCO3)	mg/L	1	<1			<1			<1		
Alkalinity (Bicarbonate as CaCO3)	mg/L	1	119			151			151		
Alkalinity (Hydroxide) as CaCO3	mg/L	1	<1			<1			<1		
Alkalinity (total) as CaCO3	mg/L	1	119			151			151		
Anions Total	meq/L	0.01	603			604			604		
Cations Total	meq/L	0.01	662			692			692		
Chloride	mg/L	1	19,400			19,300			19,300		
Ionic Balance	%	0.01	4.68			6.82			6.82		
Sulphate as SO4 - Turbidimetric (filtered)	mg/L	1	2,580			2,720			2,720		
Metals											
Calcium (filtered)	mg/L	1	461			494			494		
Magnesium (filtered)	mg/L	1	1,500			1,570			1,570		
Potassium (filtered)	mg/L	1	622			652			652		
Sodium (filtered)	mg/L	1	11,500			12,000			12,000		

*RPDs have only been considered where a concentration is greater than 1 times
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs f
***Interlab Duplicates are matched on a per compound basis as methods vary b

	Field ID	0089_SD369_220314	0089_QC109_220314		0089_SD369_220314	0089_QC209_220314		0089_SD367_220314	0089_QC110_220314		0089_SD367_220314	0089_QC210_220314	
	Date	14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022		14/03/2022	14/03/2022	
	Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
	Lab Report Number	EP2202978	EP2202978	RPD	EP2202978	872911	RPD	EP2202978	EP2202978	RPD	EP2202978	872911	RPD
	Unit	LOR											
Sample Preparation													
Moisture Content	%	0.1	31.4	37.5	18	31.4	30	5	32.8	33.4	2	32.8	34	4
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005					<0.005						<0.005	
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.0005	0.0006	18	0.0005	<0.005	0	0.0006	0.0006	0	0.0006	<0.005	0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005					<0.005						<0.005	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS														
Sum of PFHxS and PFOS	mg/kg	0.0002	0.0005	0.0006	18	0.0005	<0.005	0	0.0006	0.0006	0	0.0006	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0005	0.0006	18	0.0005	<0.01	0	0.0006	0.0006	0	0.0006	<0.01	0
Sum of PFAS	mg/kg	0.0002	0.0005	0.0006	18	0.0005	<0.05	0	0.0006	0.0006	0	0.0006	<0.05	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	mg/kg	0.005					<0.005						<0.005	
Sum of PFAS (PFOS + PFOA)	mg/kg	0.005					<0.005						<0.005	

*RPDs have only been considered where a concentration is greater than 1 times the LOR.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

		Field ID	0089_SD356_220315	0089_QC112_220315		0089_SD356_220315	0089_QC212_220315		0089_SD329_220315	0089_QC115_220315		0089_SD329_220315	0089_QC215_220315	
		Date	15/03/2022	15/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022	
		Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
		Lab Report Number	EP2203020	EP2203020	RPD	EP2203020	872903	RPD	EP2203020	EP2203020	RPD	EP2203020	872903	RPD
	Unit	LOR												
Sample Preparation														
Moisture Content	%	0.1	21.1	20.8	1	21.1	23	9	20.8	22.6	8	20.8	26	22
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005					<0.005						<0.005	
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005					<0.005						<0.005	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS														
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
Sum of PFAS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.05	0	<0.0002	<0.0002	0	<0.0002	<0.05	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	mg/kg	0.005					<0.005						<0.005	
Sum of PFAS (PFOS + PFOA)	mg/kg	0.005					<0.005						<0.005	

	PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Carboxylic Acids												
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorobutanoic acid (PFBA)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.05	0.05	0.05	0.05	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.05
PFAS NEMP 2020 Drinking Water									*0.56*								
PFAS NEMP 2020 Interim Marine 99%									19								
PFAS NEMP 2020 Recreational Water									**10**								
Field ID	**Date**	**Sample Type**	**Lab Report No.**														
0089_QC301_220314	**14/03/2022**	**Rinsate**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC301_220315	**15/03/2022**	**Rinsate**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC301_220316	**16/03/2022**	**Rinsate**	**EP2203057**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC301_220317	**17/03/2022**	**Rinsate**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC301_220318	**18/03/2022**	**Rinsate**	**EP2203194**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC302_220314	**14/03/2022**	**Rinsate**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC302_220315	**15/03/2022**	**Rinsate**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC302_220316	**16/03/2022**	**Rinsate**	**EP2203057**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC303_220314	**14/03/2022**	**Rinsate**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC401_220314	**14/03/2022**	**Field_B**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC401_220315	**15/03/2022**	**Field_B**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC401_220316	**16/03/2022**	**Field_B**	**EP2203057**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC401_220317	**17/03/2022**	**Field_B**	**EP2203138**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC401_220318	**18/03/2022**	**Field_B**	**EP2203194**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC402_220314	**14/03/2022**	**Field_B**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC402_220315	**15/03/2022**	**Field_B**	**EP2203019**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC402_220316	**16/03/2022**	**Field_B**	**EP2203057**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
0089_QC403_220314	**14/03/2022**	**Field_B**	**EP2202975**	<0.05	<0.05	<0.05	<0.05	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

	PFAS - Perfluoroalkyl Sulfonamides					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS		
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Sum of PFAS (WA DER List)_	Sum of PFHxS and PFOS	Sum of PFAS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.02	0.05	0.05	0.02	0.05	0.02	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water													*0.07*	
PFAS NEMP 2020 Interim Marine 99%										0.00023				
PFAS NEMP 2020 Recreational Water													**2**	
Field ID	**Date**	**Sample Type**	**Lab Report No.**											
0089_QC301_220314	**14/03/2022**	**Rinsate**	**EP2202975**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC301_220315	**15/03/2022**	**Rinsate**	**EP2203019**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC301_220316	**16/03/2022**	**Rinsate**	**EP2203057**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC301_220317	**17/03/2022**	**Rinsate**	**EP2203138**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC301_220318	**18/03/2022**	**Rinsate**	**EP2203194**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC302_220314	**14/03/2022**	**Rinsate**	**EP2202975**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC302_220315	**15/03/2022**	**Rinsate**	**EP2203019**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC302_220316	**16/03/2022**	**Rinsate**	**EP2203057**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC303_220314	**14/03/2022**	**Rinsate**	**EP2202975**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC401_220314	**14/03/2022**	**Field_B**	**EP2202975**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC401_220315	**15/03/2022**	**Field_B**	**EP2203019**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC401_220316	**16/03/2022**	**Field_B**	**EP2203057**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC401_220317	**17/03/2022**	**Field_B**	**EP2203138**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC401_220318	**18/03/2022**	**Field_B**	**EP2203194**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC402_220314	**14/03/2022**	**Field_B**	**EP2202975**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC402_220315	**15/03/2022**	**Field_B**	**EP2203019**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC402_220316	**16/03/2022**	**Field_B**	**EP2203057**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
0089_QC403_220314	**14/03/2022**	**Field_B**	**EP2202975**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

APPENDIX

C

LABORATORY CERTIFICATES

CHAIN OF CUSTODY

COC#: 34992 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/3 12pm	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? (Yes) No N/A

Free ice / frozen ice bricks present upon receipt? (Yes) No N/A

Random Sample Temperature on Receipt: 17.0 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW123		14/03/2022 08:22 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW121		14/03/2022 08:59 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_QC102		14/03/2022 09:01 AM	Water	ALS: 3 Non ALS: 0	No		X		
004	0089_MW120		14/03/2022 09:30 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			Extra PFAS bottles for lab QC
005	0089_QC104		14/03/2022 09:32 AM	Water	ALS: 3 Non ALS: 0	No		X		
006	0089_MW112		14/03/2022 09:50 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_QC105		14/03/2022 09:51 AM	Water	ALS: 3 Non ALS: 0	No		X		
008	0089_MW500		14/03/2022 10:08 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			Extra PFAS bottles for lab QC
009	0089_MW196		14/03/2022 10:43 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

Environmental Division Perth

Work Order Reference

EP2202975

Telephone : -- 61-8-9406 1301

CHAIN OF CUSTODY

(ALS) COC#: **34992** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC108		14/03/2022 10:45 AM	Water	ALS: 3 Non ALS: 0	No		X		
011	0089_MW109		14/03/2022 10:48 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
012	0089_QC106		14/03/2022 10:49 AM	Water	ALS: 3 Non ALS: 0	No		X		
013	0089_QC301		14/03/2022 06:56 PM	Water	ALS: 2 Non ALS: 0	No		X		
014	0089_QC302		14/03/2022 06:57 PM	Water	ALS: 2 Non ALS: 0	No		X		
015	0089_QC303		14/03/2022 06:58 PM	Water	ALS: 2 Non ALS: 0	No		X		
016	0089_QC401		14/03/2022 06:58 PM	Water	ALS: 2 Non ALS: 0	No		X		
017	0089_QC402		14/03/2022 06:59 PM	Water	ALS: 2 Non ALS: 0	No		X		
018	0089_QC403		14/03/2022 06:59 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: **34992** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW123	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW121	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW120	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW112	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW500	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW196	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW109	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **34992** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW123	Clear Plastic Bottle - Natural	250 mL	00070621079710	Green	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00350621043717	Grey	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00350621043680	Grey	No	
002	0089_MW121	Clear Plastic Bottle - Natural	250 mL	00070621080022	Green	No	
002	0089_MW121	HDPE (no PTFE)	20 mL	00350621046793	Grey	No	
002	0089_MW121	HDPE (no PTFE)	20 mL	00350621046722	Grey	No	
003	0089_QC102	Clear Plastic Bottle - Natural	250 mL	00070621079888	Green	No	
003	0089_QC102	HDPE (no PTFE)	20 mL	00350621043722	Grey	No	
003	0089_QC102	HDPE (no PTFE)	20 mL	00350621043726	Grey	No	
004	0089_MW120	HDPE (no PTFE)	20 mL	00350821044816	Grey	No	
004	0089_MW120	HDPE (no PTFE)	20 mL	00350019159279	Grey	No	
004	0089_MW120	Clear Plastic Bottle - Natural	250 mL	00070621061592	Green	No	
004	0089_MW120	HDPE (no PTFE)	20 mL	00350821044932	Grey	No	
004	0089_MW120	HDPE (no PTFE)	20 mL	00350019159390	Grey	No	
005	0089_QC104	Clear Plastic Bottle - Natural	250 mL	00070621079820	Green	No	
005	0089_QC104	HDPE (no PTFE)	20 mL	00350621046576	Grey	No	
005	0089_QC104	HDPE (no PTFE)	20 mL	00350621046577	Grey	No	
006	0089_MW112	Clear Plastic Bottle - Natural	250 mL	00070621079707	Green	No	
006	0089_MW112	HDPE (no PTFE)	20 mL	00350821044855	Grey	No	
006	0089_MW112	HDPE (no PTFE)	20 mL	00350621043779	Grey	No	
007	0089_QC105	Clear Plastic Bottle - Natural	250 mL	00070621079897	Green	No	
007	0089_QC105	HDPE (no PTFE)	20 mL	00350621043683	Grey	No	
007	0089_QC105	HDPE (no PTFE)	20 mL	00350621043714	Grey	No	
008	0089_MW500	Clear Plastic Bottle - Natural	250 mL	00070621080006	Green	No	
008	0089_MW500	HDPE (no PTFE)	20 mL	00350621046819	Grey	No	
008	0089_MW500	HDPE (no PTFE)	20 mL	00352101071813	Grey	No	

CHAIN OF CUSTODY

COC#: **34992** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_MW500	HDPE (no PTFE)	20 mL	00350621046777	Grey	No	
008	0089_MW500	HDPE (no PTFE)	20 mL	00352101071372	Grey	No	
009	0089_MW196	HDPE (no PTFE)	20 mL	00350621046427	Grey	No	
009	0089_MW196	HDPE (no PTFE)	20 mL	00350621046827	Grey	No	
009	0089_MW196	Clear Plastic Bottle - Natural	250 mL	00070621079735	Green	No	
010	0089_QC108	HDPE (no PTFE)	20 mL	00350621043701	Grey	No	
010	0089_QC108	HDPE (no PTFE)	20 mL	00350821044756	Grey	No	
010	0089_QC108	Clear Plastic Bottle - Natural	250 mL	00070621079782	Green	No	
011	0089_MW109	Clear Plastic Bottle - Natural	250 mL	00070621079202	Green	No	
011	0089_MW109	HDPE (no PTFE)	20 mL	00350821044842	Grey	No	
011	0089_MW109	HDPE (no PTFE)	20 mL	00350621043728	Grey	No	
012	0089_QC106	HDPE (no PTFE)	20 mL	00350821044877	Grey	No	
012	0089_QC106	HDPE (no PTFE)	20 mL	00350821044940	Grey	No	
012	0089_QC106	Clear Plastic Bottle - Natural	250 mL	00070621079233	Green	No	
013	0089_QC301	HDPE (no PTFE)	20 mL	00352101070957	Grey	No	
013	0089_QC301	HDPE (no PTFE)	20 mL	00352101071423	Grey	No	
014	0089_QC302	HDPE (no PTFE)	20 mL	00352101070789	Grey	No	
014	0089_QC302	HDPE (no PTFE)	20 mL	00352010008513	Grey	No	
015	0089_QC303	HDPE (no PTFE)	20 mL	00352101038028	Grey	No	
015	0089_QC303	HDPE (no PTFE)	20 mL	00352101071809	Grey	No	
016	0089_QC401	HDPE (no PTFE)	20 mL	00352101071810	Grey	No	
016	0089_QC401	HDPE (no PTFE)	20 mL	00352101071968	Grey	No	
017	0089_QC402	HDPE (no PTFE)	20 mL	00352010008730	Grey	No	
017	0089_QC402	HDPE (no PTFE)	20 mL	00352101071510	Grey	No	
018	0089_QC403	HDPE (no PTFE)	20 mL	00352010008473	Grey	No	
018	0089_QC403	HDPE (no PTFE)	20 mL	00352101071458	Grey	No	

Total Bottle Count: ALS: 52, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2202975**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 34992	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2022 12:00	Issue Date	: 16-Mar-2022
Client Requested Due Date	: 23-Mar-2022	Scheduled Reporting Date	: **23-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 17.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 18 / 18

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2202975-001	14-Mar-2022 08:22	0089_MW123_220314	✓	✓	✓	✓
EP2202975-002	14-Mar-2022 08:59	0089_MW121_220314	✓	✓	✓	✓
EP2202975-003	14-Mar-2022 09:01	0089_QC102_220314		✓		
EP2202975-004	14-Mar-2022 09:30	0089_MW120_220314	✓	✓	✓	✓
EP2202975-005	14-Mar-2022 09:32	0089_QC104_220314		✓		
EP2202975-006	14-Mar-2022 09:50	0089_MW112_220314	✓	✓	✓	✓
EP2202975-007	14-Mar-2022 09:51	0089_QC105_220314		✓		
EP2202975-008	14-Mar-2022 10:08	0089_MW500_220314	✓	✓	✓	✓
EP2202975-009	14-Mar-2022 10:43	0089_MW196_220314	✓	✓	✓	✓
EP2202975-010	14-Mar-2022 10:45	0089_QC108_220314		✓		
EP2202975-011	14-Mar-2022 10:48	0089_MW109_220314	✓	✓	✓	✓
EP2202975-012	14-Mar-2022 10:49	0089_QC106_220314		✓		
EP2202975-013	14-Mar-2022 18:56	0089_QC301_220314		✓		
EP2202975-014	14-Mar-2022 18:57	0089_QC302_220314		✓		
EP2202975-015	14-Mar-2022 18:58	0089_QC303_220314		✓		
EP2202975-016	14-Mar-2022 18:58	0089_QC401_220314		✓		
EP2202975-017	14-Mar-2022 18:59	0089_QC402_220314		✓		
EP2202975-018	14-Mar-2022 18:59	0089_QC403_220314		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2202975**	Page	: 1 of 16
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022 12:00
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 34992	Issue Date	: 22-Mar-2022 13:37
Sampler	: [redacted]		
Site	: DEF19009/Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 18		
No. of samples analysed	: 18		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_220314	0089_MW121_220314	0089_QC102_220314	0089_MW120_220314	0089_QC104_220314
				Sampling date / time	14-Mar-2022 08:22	14-Mar-2022 08:59	14-Mar-2022 09:01	14-Mar-2022 09:30	14-Mar-2022 09:32
Compound	CAS Number	LOR	Unit		EP2202975-001	EP2202975-002	EP2202975-003	EP2202975-004	EP2202975-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**434**	**270**	----	**232**	----
Total Alkalinity as CaCO3	----	1	mg/L		**434**	**270**	----	**232**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**9**	**10**	----	**21**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**299**	**24**	----	**42**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**103**	**76**	----	**78**	----
Magnesium	7439-95-4	1	mg/L		**51**	**13**	----	**16**	----
Sodium	7440-23-5	1	mg/L		**166**	**15**	----	**27**	----
Potassium	7440-09-7	1	mg/L		**4**	**2**	----	**3**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**17.3**	**6.28**	----	**6.26**	----
ø Total Cations	----	0.01	meq/L		**16.7**	**5.56**	----	**6.46**	----
ø Ionic Balance	----	0.01	%		**1.86**	**6.03**	----	**1.60**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.31**	<0.02	<0.02	**0.02**	**0.02**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.22**	<0.02	<0.02	**0.06**	**0.06**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.70**	**0.16**	**0.16**	**6.94**	**8.05**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.03**	**0.03**	**2.40**	**2.57**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.06**	**0.33**	**0.43**	**1.21**	**1.32**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.1**	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.17**	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.84**	**0.04**	**0.05**	**0.13**	**0.13**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW123_220314	0089_MW121_220314	0089_QC102_220314	0089_MW120_220314	0089_QC104_220314
				Sampling date / time	14-Mar-2022 08:22	14-Mar-2022 08:59	14-Mar-2022 09:01	14-Mar-2022 09:30	14-Mar-2022 09:32
					EP2202975-001	EP2202975-002	EP2202975-003	EP2202975-004	EP2202975-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.04**	**0.05**	**1.59**	**1.57**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW123_220314	0089_MW121_220314	0089_QC102_220314	0089_MW120_220314	0089_QC104_220314
				Sampling date / time	14-Mar-2022 08:22	14-Mar-2022 08:59	14-Mar-2022 09:01	14-Mar-2022 09:30	14-Mar-2022 09:32
					EP2202975-001	EP2202975-002	EP2202975-003	EP2202975-004	EP2202975-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**2.44**	**0.60**	**0.72**	**12.4**	**13.7**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.76**	**0.49**	**0.59**	**8.15**	**9.37**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.22**	**0.57**	**0.69**	**9.89**	**11.1**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**89.2**	**91.3**	**96.7**	**92.4**
13C8-PFOA	----	0.02	%		**104**	**101**	**109**	**105**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_220314	0089_QC105_220314	0089_MW500_220314	0089_MW196_220314	0089_QC108_220314
				Sampling date / time	14-Mar-2022 09:50	14-Mar-2022 09:51	14-Mar-2022 10:08	14-Mar-2022 10:43	14-Mar-2022 10:45
Compound	CAS Number	LOR	Unit		EP2202975-006	EP2202975-007	EP2202975-008	EP2202975-009	EP2202975-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		205	----	432	226	----
Total Alkalinity as CaCO3	----	1	mg/L		205	----	432	226	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		17	----	35	26	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		28	----	26	31	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		73	----	149	76	----
Magnesium	7439-95-4	1	mg/L		9	----	18	20	----
Sodium	7440-23-5	1	mg/L		23	----	24	24	----
Potassium	7440-09-7	1	mg/L		<1	----	4	2	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		5.24	----	10.1	5.93	----
ø Total Cations	----	0.01	meq/L		5.38	----	10.1	6.53	----
ø Ionic Balance	----	0.01	%		1.36	----	0.15	4.83	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.11	0.10	0.26	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.50	0.34	0.63	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		12.2	7.98	11.4	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		2.58	2.43	2.91	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		44.8	39.7	45.3	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.1	0.1	0.2	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.29	0.29	0.43	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		1.68	1.63	3.23	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.59	0.57	0.37	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_220314	0089_QC105_220314	0089_MW500_220314	0089_MW196_220314	0089_QC108_220314
				Sampling date / time	14-Mar-2022 09:50	14-Mar-2022 09:51	14-Mar-2022 10:08	14-Mar-2022 10:43	14-Mar-2022 10:45
Compound	CAS Number	LOR	Unit		EP2202975-006	EP2202975-007	EP2202975-008	EP2202975-009	EP2202975-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.67**	**1.57**	**1.40**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.08**	**0.07**	**0.02**	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.49**	**0.47**	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.12**	**0.15**	**0.10**	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_220314	0089_QC105_220314	0089_MW500_220314	0089_MW196_220314	0089_QC108_220314
				Sampling date / time	14-Mar-2022 09:50	14-Mar-2022 09:51	14-Mar-2022 10:08	14-Mar-2022 10:43	14-Mar-2022 10:45
Compound	CAS Number	LOR	Unit		EP2202975-006	EP2202975-007	EP2202975-008	EP2202975-009	EP2202975-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**65.2**	**55.4**	**66.2**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**57.0**	**47.7**	**56.7**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**61.6**	**52.1**	**62.7**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**78.0**	**90.5**	**70.2**	**90.5**	**95.5**
13C8-PFOA	----	0.02	%		**104**	**101**	**100**	**107**	**105**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW109_220314	0089_QC106_220314	----	----	----
				Sampling date / time	14-Mar-2022 10:48	14-Mar-2022 10:49	----	----	----
Compound	CAS Number	LOR	Unit		EP2202975-011	EP2202975-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		437	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		437	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		37	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		200	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		120	----	----	----	----
Magnesium	7439-95-4	1	mg/L		51	----	----	----	----
Sodium	7440-23-5	1	mg/L		127	----	----	----	----
Potassium	7440-09-7	1	mg/L		2	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		15.1	----	----	----	----
ø Total Cations	----	0.01	meq/L		15.8	----	----	----	----
ø Ionic Balance	----	0.01	%		2.00	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.22	0.21	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.68	0.37	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		6.84	5.61	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.42	0.38	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		3.42	3.04	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.1	0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.19	0.17	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		1.41	1.29	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.12	0.12	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW109_220314	0089_QC106_220314	----	----	----
				Sampling date / time	14-Mar-2022 10:48	14-Mar-2022 10:49	----	----	----
Compound	CAS Number	LOR	Unit		EP2202975-011	EP2202975-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.38**	**0.35**	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW109_220314	0089_QC106_220314	----	----	----
				Sampling date / time	14-Mar-2022 10:48	14-Mar-2022 10:49	----	----	----
Compound	CAS Number	LOR	Unit		EP2202975-011	EP2202975-012	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**13.8**	**11.6**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**10.3**	**8.65**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**12.7**	**10.9**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.9**	**90.8**	----	----	----
13C8-PFOA	----	0.02	%		**102**	**105**	----	----	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC301_220314	0089_QC302_220314	0089_QC303_220314	0089_QC401_220314	0089_QC402_220314
				Sampling date / time	14-Mar-2022 18:56	14-Mar-2022 18:57	14-Mar-2022 18:58	14-Mar-2022 18:58	14-Mar-2022 18:59
					EP2202975-013	EP2202975-014	EP2202975-015	EP2202975-016	EP2202975-017
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220314	0089_QC302_220314	0089_QC303_220314	0089_QC401_220314	0089_QC402_220314
				Sampling date / time	14-Mar-2022 18:56	14-Mar-2022 18:57	14-Mar-2022 18:58	14-Mar-2022 18:58	14-Mar-2022 18:59
Compound	CAS Number	LOR	Unit		EP2202975-013	EP2202975-014	EP2202975-015	EP2202975-016	EP2202975-017
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.7**	**97.6**	**92.8**	**88.2**	**90.0**
13C8-PFOA	----	0.02	%		**108**	**98.5**	**106**	**97.5**	**101**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	0089_QC403_220314	----	----	----	----
				Sampling date / time	14-Mar-2022 18:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2202975-018	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_220314	----	----	----	----
				Sampling date / time	14-Mar-2022 18:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2202975-018	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.7**	----	----	----	----
13C8-PFOA	----	0.02	%		**107**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2202975**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 34992	Issue Date	: 22-Mar-2022
Sampler	: [redacted]		
Site	: DEF19009/Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 18		
No. of samples analysed	: 18		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4233402)									
EP2202975-004	0089_MW120_220314	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	232	230	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	232	230	0.8	0% - 20%
EP2202968-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	270	288	6.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	270	288	6.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4234037)									
EP2202975-009	0089_MW196_220314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	26	0.0	0% - 20%
EP2202975-001	0089_MW123_220314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	9	9	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4234038)									
EP2202975-009	0089_MW196_220314	ED045G: Chloride	16887-00-6	1	mg/L	31	32	0.0	0% - 20%
EP2202975-001	0089_MW123_220314	ED045G: Chloride	16887-00-6	1	mg/L	299	281	6.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4232910)									
EP2202975-001	0089_MW123_220314	ED093F: Calcium	7440-70-2	1	mg/L	103	105	2.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	51	52	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	166	168	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EP2202977-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	494	478	3.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1590	1540	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12100	11800	2.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	644	625	3.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4239424)									
EP2202975-004	0089_MW120_220314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	6.94	7.54	8.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.21	1.36	12.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.07	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	2.40	2.67	10.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2202976-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4239424)									
EP2202975-004	0089_MW120_220314	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.59	1.66	4.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.13	0.14	11.1	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2202976-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4239424)									
EP2202975-004	0089_MW120_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4239424) - continued									
EP2202975-004	0089_MW120_220314	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2202976-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4239424)									
EP2202975-004	0089_MW120_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2202976-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4239424)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4239424) - continued									
EP2202975-004	0089_MW120_220314	EP231X: Sum of PFAS	----	0.01	µg/L	12.4	13.5	8.8	0% - 20%
EP2202976-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.01	0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4233402)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	81.2	126
				<1	200 mg/L	99.8	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234037)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	87.7	113
				<1	500 mg/L	96.0	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4234038)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	87.9	114
				<1	1000 mg/L	105	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4232910)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.6	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.6	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.2	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239424)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	82.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	81.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	110	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239424)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	129	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	115	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	99.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239424) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239424)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	103	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	74.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	128	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	86.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	114	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	85.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239424)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	123	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	90.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	85.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	76.0	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234037)							
EP2202950-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4234038)							
EP2202975-001	0089_MW123_220314	ED045G: Chloride	16887-00-6	1000 mg/L	107	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239424)							
EP2202975-008	0089_MW500_220314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	80.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	96.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239424) - continued							
EP2202975-008	0089_MW500_220314	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	# Not Determined	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	139	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239424)							
EP2202975-008	0089_MW500_220314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	106	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	72.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	81.0	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	# Not Determined	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	105	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	116	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	120	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239424)							
EP2202975-008	0089_MW500_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	107	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	96.6	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.8	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	111	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.0	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	106	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	93.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239424)							
EP2202975-008	0089_MW500_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	118	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	64.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	84.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	82.0	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2202975**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Site	: DEF19009/Stirling GW - MB	Issue Date	: 22-Mar-2022
Sampler	: [redacted]	No. of samples received	: 18
Order number	: DEF19009/730	No. of samples analysed	: 18

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2202950--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2202975--008	0089_MW500_220314	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2202975--008	0089_MW500_220314	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2202975--008	0089_MW500_220314	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2202975--008	0089_MW500_220314	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2202975--008	0089_MW500_220314	**Perfluorooctanoic acid (PFOA)**	335-67-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW123_220314, 0089_MW121_220314, 0089_MW120_220314, 0089_MW112_220314, 0089_MW500_220314, 0089_MW196_220314, 0089_MW109_220314	**14-Mar-2022**	**----**	----	----	**17-Mar-2022**	28-Mar-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW123_220314, 0089_MW121_220314, 0089_MW120_220314, 0089_MW112_220314, 0089_MW500_220314, 0089_MW196_220314, 0089_MW109_220314	**14-Mar-2022**	**----**	----	----	**18-Mar-2022**	11-Apr-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW123_220314, 0089_MW121_220314, 0089_MW120_220314, 0089_MW112_220314, 0089_MW500_220314, 0089_MW196_220314, 0089_MW109_220314	**14-Mar-2022**	**----**	----	----	**18-Mar-2022**	11-Apr-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW123_220314, 0089_MW121_220314, 0089_MW120_220314, 0089_MW112_220314, 0089_MW500_220314, 0089_MW196_220314, 0089_MW109_220314	**14-Mar-2022**	**----**	----	----	**17-Mar-2022**	21-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_220314, 0089_MW121_220314, 0089_QC102_220314, 0089_MW120_220314, 0089_QC104_220314, 0089_MW112_220314, 0089_QC105_220314, 0089_MW500_220314, 0089_MW196_220314, 0089_QC108_220314, 0089_MW109_220314, 0089_QC106_220314, 0089_QC301_220314, 0089_QC302_220314, 0089_QC303_220314, 0089_QC401_220314, 0089_QC402_220314, 0089_QC403_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_220314, 0089_MW121_220314, 0089_QC102_220314, 0089_MW120_220314, 0089_QC104_220314, 0089_MW112_220314, 0089_QC105_220314, 0089_MW500_220314, 0089_MW196_220314, 0089_QC108_220314, 0089_MW109_220314, 0089_QC106_220314, 0089_QC301_220314, 0089_QC302_220314, 0089_QC303_220314, 0089_QC401_220314, 0089_QC402_220314, 0089_QC403_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW123_220314, 0089_MW121_220314, 0089_QC102_220314, 0089_MW120_220314, 0089_QC104_220314, 0089_MW112_220314, 0089_QC105_220314, 0089_MW500_220314, 0089_MW196_220314, 0089_QC108_220314, 0089_MW109_220314, 0089_QC106_220314, 0089_QC301_220314, 0089_QC302_220314, 0089_QC303_220314, 0089_QC401_220314, 0089_QC402_220314, 0089_QC403_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_220314, 0089_MW121_220314, 0089_QC102_220314, 0089_MW120_220314, 0089_QC104_220314, 0089_MW112_220314, 0089_QC105_220314, 0089_MW500_220314, 0089_MW196_220314, 0089_QC108_220314, 0089_MW109_220314, 0089_QC106_220314, 0089_QC301_220314, 0089_QC302_220314, 0089_QC303_220314, 0089_QC401_220314, 0089_QC402_220314, 0089_QC403_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW123_220314, 0089_MW121_220314, 0089_QC102_220314, 0089_MW120_220314, 0089_QC104_220314, 0089_MW112_220314, 0089_QC105_220314, 0089_MW500_220314, 0089_MW196_220314, 0089_QC108_220314, 0089_MW109_220314, 0089_QC106_220314, 0089_QC301_220314, 0089_QC302_220314, 0089_QC303_220314, 0089_QC401_220314, 0089_QC402_220314, 0089_QC403_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ▯ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **35001** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	[redacted] BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	15/3 12pm	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? (Yes) No N/A

Free ice / frozen ice bricks present upon receipt? (Yes) No N/A

Random Sample Temperature on Receipt: 17.0 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW124		14/03/2022 08:12 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_MW125		14/03/2022 08:55 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_QC103		14/03/2022 08:57 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW126		14/03/2022 09:44 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
005	0089_MW127		14/03/2022 10:35 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_MW200		14/03/2022 11:38 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

Environmental Division
Perth
Work Order Reference
EP2202976

Telephone : -- 61-8-9406 1301

CHAIN OF CUSTODY

COC#: **35001** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW124	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW125	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_QC103	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW126	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW127	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW200	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **35001** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW124	Clear Plastic Bottle - Natural	250 mL	00070621079266	Green	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350821044868	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350821044770	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350621043786	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350821044765	Grey	No	
002	0089_MW125	Clear Plastic Bottle - Natural	250 mL	00070621079226	Green	No	
002	0089_MW125	HDPE (no PTFE)	20 mL	00350821044930	Grey	No	
002	0089_MW125	HDPE (no PTFE)	20 mL	00350821044776	Grey	No	
003	0089_QC103	Clear Plastic Bottle - Natural	250 mL	00070621079252	Green	No	
003	0089_QC103	HDPE (no PTFE)	20 mL	00350621043690	Grey	No	
003	0089_QC103	HDPE (no PTFE)	20 mL	00350621043699	Grey	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350821044786	Grey	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350821044763	Grey	No	
004	0089_MW126	Clear Plastic Bottle - Natural	250 mL	00070621079245	Green	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350821044813	Grey	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350821044812	Grey	No	
005	0089_MW127	Clear Plastic Bottle - Natural	250 mL	00070621079286	Green	No	
005	0089_MW127	HDPE (no PTFE)	20 mL	00350621043706	Grey	No	
005	0089_MW127	HDPE (no PTFE)	20 mL	00350621043746	Grey	No	
006	0089_MW200	Clear Plastic Bottle - Natural	250 mL	00070621079217	Green	No	
006	0089_MW200	HDPE (no PTFE)	20 mL	00350821044891	Grey	No	
006	0089_MW200	HDPE (no PTFE)	20 mL	00350821044861	Grey	No	

Total Bottle Count: ALS: 22, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2202976**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 35001	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2022 12:00	Issue Date	: 16-Mar-2022
Client Requested Due Date	: 23-Mar-2022	Scheduled Reporting Date	: **23-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 17.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2202976-001	14-Mar-2022 08:12	0089_MW124_220314	✓	✓	✓	✓
EP2202976-002	14-Mar-2022 08:55	0089_MW125_220314	✓	✓	✓	✓
EP2202976-003	14-Mar-2022 08:57	0089_QC103_220314	✓	✓	✓	✓
EP2202976-004	14-Mar-2022 09:44	0089_MW126_220314	✓	✓	✓	✓
EP2202976-005	14-Mar-2022 10:35	0089_MW127_220314	✓	✓	✓	✓
EP2202976-006	14-Mar-2022 11:38	0089_MW200_220314	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2202976**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022 12:00
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35001	Issue Date	: 22-Mar-2022 13:56
Sampler	: [redacted]		
Site	: DEF19009/Stirling GW JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_220314	0089_MW125_220314	0089_QC103_220314	0089_MW126_220314	0089_MW127_220314
				Sampling date / time	14-Mar-2022 08:12	14-Mar-2022 08:55	14-Mar-2022 08:57	14-Mar-2022 09:44	14-Mar-2022 10:35
Compound	CAS Number	LOR	Unit		EP2202976-001	EP2202976-002	EP2202976-003	EP2202976-004	EP2202976-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		343	417	415	616	488
Total Alkalinity as CaCO3	----	1	mg/L		343	417	415	616	488
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1900	2000	1960	1660	1620
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		15000	16100	15500	15500	13800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		457	473	497	444	385
Magnesium	7439-95-4	1	mg/L		1130	1210	1240	1160	1050
Sodium	7440-23-5	1	mg/L		8140	8490	8740	7890	6870
Potassium	7440-09-7	1	mg/L		420	439	453	394	345
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		470	504	486	484	433
ø Total Cations	----	0.01	meq/L		481	504	519	471	413
ø Ionic Balance	----	0.01	%		1.16	0.04	3.21	1.38	2.30
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.17	0.17	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.18	0.19	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.01	0.72	0.79	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.03	0.03	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.22	0.23	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW124_220314	0089_MW125_220314	0089_QC103_220314	0089_MW126_220314	0089_MW127_220314
				Sampling date / time	14-Mar-2022 08:12	14-Mar-2022 08:55	14-Mar-2022 08:57	14-Mar-2022 09:44	14-Mar-2022 10:35
					EP2202976-001	EP2202976-002	EP2202976-003	EP2202976-004	EP2202976-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW124_220314	0089_MW125_220314	0089_QC103_220314	0089_MW126_220314	0089_MW127_220314
				Sampling date / time	14-Mar-2022 08:12	14-Mar-2022 08:55	14-Mar-2022 08:57	14-Mar-2022 09:44	14-Mar-2022 10:35
					EP2202976-001	EP2202976-002	EP2202976-003	EP2202976-004	EP2202976-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.01**	**1.32**	**1.41**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.72**	**0.79**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**1.14**	**1.22**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.1**	**96.0**	**93.6**	**96.3**	**94.5**
13C8-PFOA	----	0.02	%		**109**	**104**	**106**	**102**	**104**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_220314	----	----	----	----
				Sampling date / time	14-Mar-2022 11:38	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2202976-006	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**389**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**389**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**219**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2060**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**112**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**123**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**1320**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**77**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**70.4**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**75.1**	----	----	----	----
ø Ionic Balance	----	0.01	%		**3.20**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_220314	----	----	----	----
				Sampling date / time	14-Mar-2022 11:38	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2202976-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_220314	----	----	----	----
				Sampling date / time	14-Mar-2022 11:38	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2202976-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.0**	----	----	----	----
13C8-PFOA	----	0.02	%		**111**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2202976**	Page	: 1 of 12
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35001	Issue Date	: 22-Mar-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4233402)									
EP2202975-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	232	230	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	232	230	0.8	0% - 20%
EP2202968-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	270	288	6.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	270	288	6.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4233405)									
EP2202976-005	0089_MW127_220314	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	488	491	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	488	491	0.5	0% - 20%
EP2202977-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	121	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	121	1.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4234037)									
EP2202975-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	26	0.0	0% - 20%
EP2202975-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	9	9	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4234038)									
EP2202975-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	31	32	0.0	0% - 20%
EP2202975-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	299	281	6.2	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 4232903)									
EP2202954-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	3030	2910	3.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	19	18	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	1970	1900	3.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	37	36	3.6	0% - 20%
EP2203046-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	340	341	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	890	899	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	6880	6930	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	380	383	0.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4239424)									
EP2202975-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	6.94	7.54	8.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.21	1.36	12.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.07	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	2.40	2.67	10.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2202976-001	0089_MW124_220314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4239427)									
EP2202977-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4239424)									
EP2202975-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.59	1.66	4.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.13	0.14	11.1	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4239424) - continued									
EP2202976-001	0089_MW124_220314	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4239427)									
EP2202977-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4239424)									
EP2202975-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2202976-001	0089_MW124_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4239424) - continued									
EP2202976-001	0089_MW124_220314	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4239427)									
EP2202977-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4239424)									
EP2202975-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2202976-001	0089_MW124_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4239427)									
EP2202977-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4239424)									
EP2202975-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	12.4	13.5	8.8	0% - 20%
EP2202976-001	0089_MW124_220314	EP231X: Sum of PFAS	----	0.01	µg/L	0.01	0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4239427)									
EP2202977-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.05	0.05	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4233402)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	81.2	126
				<1	200 mg/L	99.8	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4233405)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	111	81.2	126
				<1	200 mg/L	101	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234037)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	87.7	113
				<1	500 mg/L	96.0	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4234038)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	87.9	114
				<1	1000 mg/L	105	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4232903)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	93.7	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	93.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.3	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239424)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	82.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	81.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	110	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239427)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	94.2	71.0	127

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239427) - continued								
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	97.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	87.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	83.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239424)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	129	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	115	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	99.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239427)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	109	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	103	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	78.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239424)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	103	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	74.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	128	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	86.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	114	65.0	136

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239424) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	85.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239427)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	91.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	76.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	111	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	89.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	82.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239424)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	123	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	90.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	85.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	76.0	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239427)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	95.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	81.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	77.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234037)							
EP2202950-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4234038)							
EP2202975-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	107	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239424)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239424) - continued							
EP2202975-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	80.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	96.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	# Not Determined	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	139	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239427)							
EP2202977-012	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	96.4	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	96.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	99.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	90.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	92.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	95.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239424)							
EP2202975-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	106	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	72.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	81.0	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	# Not Determined	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	105	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	116	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	120	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239427)							
EP2202977-012	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.6	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	101	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	117	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	98.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	119	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	107	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	97.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239427) - continued							
EP2202977-012	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	88.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239424)							
EP2202975-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	107	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	96.6	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.8	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	111	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.0	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	106	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	93.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239427)							
EP2202977-012	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	89.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	109	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	80.3	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	114	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.7	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	76.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239424)							
EP2202975-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	118	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	64.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	84.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	82.0	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239427)							
EP2202977-012	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	93.4	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	88.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	99.6	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239427) - continued							
EP2202977-012	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	86.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2202976**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Site	: DEF19009/Stirling GW JS	Issue Date	: 22-Mar-2022
Sampler	: [redacted]	No. of samples received	: 6
Order number	: DEF19009/730	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2202950--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2202975--008	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2202975--008	Anonymous	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2202975--008	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2202975--008	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2202975--008	Anonymous	**Perfluorooctanoic acid (PFOA)**	335-67-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	39	7.69	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
Container / *Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW124_220314,	0089_MW125_220314,	**14-Mar-2022**	**----**	----	----	**17-Mar-2022**	28-Mar-2022	✓
0089_QC103_220314,	0089_MW126_220314,							
0089_MW127_220314,	0089_MW200_220314							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW124_220314,	0089_MW125_220314,	**14-Mar-2022**	**----**	----	----	**18-Mar-2022**	11-Apr-2022	✓
0089_QC103_220314,	0089_MW126_220314,							
0089_MW127_220314,	0089_MW200_220314							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW124_220314,	0089_MW125_220314,	**14-Mar-2022**	**----**	----	----	**18-Mar-2022**	11-Apr-2022	✓
0089_QC103_220314,	0089_MW126_220314,							
0089_MW127_220314,	0089_MW200_220314							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW124_220314,	0089_MW125_220314,	**14-Mar-2022**	**----**	----	----	**17-Mar-2022**	21-Mar-2022	✓
0089_QC103_220314,	0089_MW126_220314,							
0089_MW127_220314,	0089_MW200_220314							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW124_220314,	0089_MW125_220314,	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
0089_QC103_220314,	0089_MW126_220314,							
0089_MW127_220314,	0089_MW200_220314							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW124_220314,	0089_MW125_220314,	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
0089_QC103_220314,	0089_MW126_220314,							
0089_MW127_220314,	0089_MW200_220314							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW124_220314,	0089_MW125_220314,	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
0089_QC103_220314,	0089_MW126_220314,							
0089_MW127_220314,	0089_MW200_220314							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW124_220314,	0089_MW125_220314,	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
0089_QC103_220314,	0089_MW126_220314,							
0089_MW127_220314,	0089_MW200_220314							

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW124_220314, 0089_MW125_220314, 0089_QC103_220314, 0089_MW126_220314, 0089_MW127_220314, 0089_MW200_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	39	**7.69**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 35003 ALS Laboratory: EP Perth

RELINQUISHED BY:	[redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	15/3 12pm	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? (Yes) No N/A

Free ice / frozen ice bricks present upon receipt? (Yes) No N/A

Random Sample Temperature on Receipt: 17.0 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW130		14/03/2022 08:14 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW335		14/03/2022 08:25 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
003	0089_PW364		14/03/2022 08:38 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_QC101		14/03/2022 08:40 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_SW132		14/03/2022 09:09 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW340		14/03/2022 09:15 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW362		14/03/2022 09:38 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_SW134		14/03/2022 09:56 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_QC107		14/03/2022 09:56 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

Environmental Division
Perth

Work Order Reference
EP2202977

Telephone : -- 61-8-9406 1301

CHAIN OF CUSTODY

ALS COC#: **35003** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW341		14/03/2022 10:08 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_PW363		14/03/2022 10:27 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_PW369		14/03/2022 11:56 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
013	0089_SW370		14/03/2022 12:20 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_PW345		14/03/2022 12:28 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
015	0089_PW367		14/03/2022 12:40 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: **35003** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW130	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW335	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW364	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_QC101	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW132	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW340	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW362	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_SW134	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_QC107	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **35003** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_PW341	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_PW363	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_PW369	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_SW370	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_PW345	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_PW367	Surface Waters WATER	Water	- NT-01 Major Cations (Ca, Mg, Na, K) - EA025H Suspended Solids - Standard Level - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **35003** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW130	Clear Plastic Bottle - Natural	250 mL	00070621079294	Green	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00350821044944	Grey	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00350821044825	Grey	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00350821044846	Grey	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00350821044881	Grey	No	
002	0089_PW335	Clear Plastic Bottle - Natural	250 mL	00070621079324	Green	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00350621043707	Grey	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00350821044799	Grey	No	
003	0089_PW364	Clear Plastic Bottle - Natural	250 mL	00070621079215	Green	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350821044912	Grey	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350821044769	Grey	No	
004	0089_QC101	Clear Plastic Bottle - Natural	250 mL	00070621079326	Green	No	
004	0089_QC101	HDPE (no PTFE)	20 mL	00350621043709	Grey	No	
004	0089_QC101	HDPE (no PTFE)	20 mL	00350821044833	Grey	No	
005	0089_SW132	HDPE (no PTFE)	20 mL	00350821044852	Grey	No	
005	0089_SW132	Clear Plastic Bottle - Natural	250 mL	00070621079300	Green	No	
005	0089_SW132	HDPE (no PTFE)	20 mL	00350821044824	Grey	No	
006	0089_PW340	HDPE (no PTFE)	20 mL	00350821044920	Grey	No	
006	0089_PW340	HDPE (no PTFE)	20 mL	00350821044856	Grey	No	
006	0089_PW340	Clear Plastic Bottle - Natural	250 mL	00070621079283	Green	No	
007	0089_PW362	HDPE (no PTFE)	20 mL	00350821044780	Grey	No	
007	0089_PW362	Clear Plastic Bottle - Natural	250 mL	00070621079201	Green	No	
007	0089_PW362	HDPE (no PTFE)	20 mL	00350821044815	Grey	No	
008	0089_SW134	Clear Plastic Bottle - Natural	250 mL	00070621079250	Green	No	
008	0089_SW134	HDPE (no PTFE)	20 mL	00350821044784	Grey	No	
008	0089_SW134	HDPE (no PTFE)	20 mL	00350621043764	Grey	No	

CHAIN OF CUSTODY

ALS COC#: **35003** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_QC107	Clear Plastic Bottle - Natural	250 mL	00070621079357	Green	No	
009	0089_QC107	HDPE (no PTFE)	20 mL	00350821044874	Grey	No	
009	0089_QC107	HDPE (no PTFE)	20 mL	00350821044905	Grey	No	
010	0089_PW341	Clear Plastic Bottle - Natural	250 mL	00070621079267	Green	No	
010	0089_PW341	HDPE (no PTFE)	20 mL	00350621043743	Grey	No	
010	0089_PW341	HDPE (no PTFE)	20 mL	00350621043698	Grey	No	
011	0089_PW363	Clear Plastic Bottle - Natural	250 mL	00070621079265	Green	No	
011	0089_PW363	HDPE (no PTFE)	20 mL	00350621043778	Grey	No	
011	0089_PW363	HDPE (no PTFE)	20 mL	00350821044939	Grey	No	
012	0089_PW369	Clear Plastic Bottle - Natural	250 mL	00070621079257	Green	No	
012	0089_PW369	HDPE (no PTFE)	20 mL	00350821044819	Grey	No	
012	0089_PW369	HDPE (no PTFE)	20 mL	00350821044807	Grey	No	
012	0089_PW369	HDPE (no PTFE)	20 mL	00350821044818	Grey	No	
012	0089_PW369	HDPE (no PTFE)	20 mL	00350821044843	Grey	No	
013	0089_SW370	Clear Plastic Bottle - Natural	250 mL	00070621079243	Green	No	
013	0089_SW370	HDPE (no PTFE)	20 mL	00350821044811	Grey	No	
013	0089_SW370	HDPE (no PTFE)	20 mL	00350821044814	Grey	No	
014	0089_PW345	HDPE (no PTFE)	20 mL	00350621043782	Grey	No	
014	0089_PW345	HDPE (no PTFE)	20 mL	00350621043713	Grey	No	
014	0089_PW345	Clear Plastic Bottle - Natural	250 mL	00070621079337	Green	No	
015	0089_PW367	Clear Plastic Bottle - Natural	250 mL	00070621079207	Green	No	
015	0089_PW367	HDPE (no PTFE)	20 mL	00350821044779	Grey	No	
015	0089_PW367	HDPE (no PTFE)	20 mL	00350621043774	Grey	No	

Total Bottle Count: ALS: 49, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2202977**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 35003	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2022 12:00	Issue Date	: 17-Mar-2022
Client Requested Due Date	: 25-Mar-2022	Scheduled Reporting Date	: **25-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 17.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2202977-001	14-Mar-2022 08:14	0089_SW130_220314	✓	✓	✓	✓
EP2202977-002	14-Mar-2022 08:25	0089_PW335_220314	✓	✓	✓	✓
EP2202977-003	14-Mar-2022 08:38	0089_PW364_220314	✓	✓	✓	✓
EP2202977-004	14-Mar-2022 08:40	0089_QC101_220314	✓	✓	✓	✓
EP2202977-005	14-Mar-2022 09:09	0089_SW132_220314	✓	✓	✓	✓
EP2202977-006	14-Mar-2022 09:15	0089_PW340_220314	✓	✓	✓	✓
EP2202977-007	14-Mar-2022 09:38	0089_PW362_220314	✓	✓	✓	✓
EP2202977-008	14-Mar-2022 09:56	0089_SW134_220314	✓	✓	✓	✓
EP2202977-009	14-Mar-2022 09:56	0089_QC107_220314	✓	✓	✓	✓
EP2202977-010	14-Mar-2022 10:08	0089_PW341_220314	✓	✓	✓	✓
EP2202977-011	14-Mar-2022 10:27	0089_PW363_220314	✓	✓	✓	✓
EP2202977-012	14-Mar-2022 11:56	0089_PW369_220314	✓	✓	✓	✓
EP2202977-013	14-Mar-2022 12:20	0089_SW370_220314	✓	✓	✓	✓
EP2202977-014	14-Mar-2022 12:28	0089_PW345_220314	✓	✓	✓	✓
EP2202977-015	14-Mar-2022 12:40	0089_PW367_220314	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2202977**	Page	: 1 of 12
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022 12:00
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35003	Issue Date	: 22-Mar-2022 09:43
Sampler	: [redacted]		
Site	: DEF19009/Stirling SW/PW JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_220314	0089_SW132_220314	0089_SW134_220314	0089_QC107_220314	0089_SW370_220314
				Sampling date / time	14-Mar-2022 08:14	14-Mar-2022 09:09	14-Mar-2022 09:56	14-Mar-2022 09:56	14-Mar-2022 12:20
Compound	CAS Number	LOR	Unit		EP2202977-001	EP2202977-005	EP2202977-008	EP2202977-009	EP2202977-013
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		120	121	121	122	124
Total Alkalinity as CaCO3	----	1	mg/L		120	121	121	122	124
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2690	2740	2720	2650	2700
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20100	20300	20200	20500	20600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		478	486	492	473	475
Magnesium	7439-95-4	1	mg/L		1550	1580	1580	1530	1550
Sodium	7440-23-5	1	mg/L		11800	12100	12100	11700	11900
Potassium	7440-09-7	1	mg/L		632	643	639	616	632
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		625	632	629	636	640
ø Total Cations	----	0.01	meq/L		681	697	697	674	685
ø Ionic Balance	----	0.01	%		4.24	4.89	5.16	2.92	3.42
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_220314	0089_SW132_220314	0089_SW134_220314	0089_QC107_220314	0089_SW370_220314
				Sampling date / time	14-Mar-2022 08:14	14-Mar-2022 09:09	14-Mar-2022 09:56	14-Mar-2022 09:56	14-Mar-2022 12:20
Compound	CAS Number	LOR	Unit		EP2202977-001	EP2202977-005	EP2202977-008	EP2202977-009	EP2202977-013
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW130_220314	0089_SW132_220314	0089_SW134_220314	0089_QC107_220314	0089_SW370_220314
				Sampling date / time	14-Mar-2022 08:14	14-Mar-2022 09:09	14-Mar-2022 09:56	14-Mar-2022 09:56	14-Mar-2022 12:20
					EP2202977-001	**EP2202977-005**	**EP2202977-008**	**EP2202977-009**	**EP2202977-013**
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.7**	**95.4**	**93.3**	**91.9**	**101**
13C8-PFOA	----	0.02	%		**102**	**108**	**105**	**103**	**110**

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW335_220314	0089_PW364_220314	0089_QC101_220314	0089_PW340_220314	0089_PW362_220314
				Sampling date / time	14-Mar-2022 08:25	14-Mar-2022 08:38	14-Mar-2022 08:40	14-Mar-2022 09:15	14-Mar-2022 09:38
					EP2202977-002	EP2202977-003	EP2202977-004	EP2202977-006	EP2202977-007
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**118**	**122**	**121**	**128**	**116**
Total Alkalinity as CaCO3	----	1	mg/L		**118**	**122**	**121**	**128**	**116**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2680**	**2510**	**2770**	**2720**	**2770**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20200**	**20600**	**20300**	**19900**	**20300**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**486**	**507**	**494**	**511**	**489**
Magnesium	7439-95-4	1	mg/L		**1580**	**1630**	**1590**	**1630**	**1570**
Sodium	7440-23-5	1	mg/L		**12000**	**12400**	**12100**	**12500**	**12000**
Potassium	7440-09-7	1	mg/L		**645**	**667**	**644**	**663**	**632**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**628**	**636**	**633**	**620**	**633**
ø Total Cations	----	0.01	meq/L		**693**	**716**	**698**	**720**	**692**
ø Ionic Balance	----	0.01	%		**4.90**	**5.92**	**4.93**	**7.44**	**4.46**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.05**	**0.02**	**0.05**	**0.01**	**0.01**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW335_220314	0089_PW364_220314	0089_QC101_220314	0089_PW340_220314	0089_PW362_220314
				Sampling date / time	14-Mar-2022 08:25	14-Mar-2022 08:38	14-Mar-2022 08:40	14-Mar-2022 09:15	14-Mar-2022 09:38
Compound	CAS Number	LOR	Unit		EP2202977-002	EP2202977-003	EP2202977-004	EP2202977-006	EP2202977-007
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW335_220314	0089_PW364_220314	0089_QC101_220314	0089_PW340_220314	0089_PW362_220314
				Sampling date / time	14-Mar-2022 08:25	14-Mar-2022 08:38	14-Mar-2022 08:40	14-Mar-2022 09:15	14-Mar-2022 09:38
Compound	CAS Number	LOR	Unit		EP2202977-002	EP2202977-003	EP2202977-004	EP2202977-006	EP2202977-007
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.05**	**0.02**	**0.05**	**0.01**	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.05**	**0.02**	**0.05**	**0.01**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.05**	**0.02**	**0.05**	**0.01**	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.8**	**94.0**	**97.2**	**93.3**	**92.2**
13C8-PFOA	----	0.02	%		**102**	**104**	**107**	**109**	**105**

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW341_220314	0089_PW363_220314	0089_PW369_220314	0089_PW345_220314	0089_PW367_220314
				Sampling date / time	14-Mar-2022 10:08	14-Mar-2022 10:27	14-Mar-2022 11:56	14-Mar-2022 12:28	14-Mar-2022 12:40
					EP2202977-010	EP2202977-011	EP2202977-012	EP2202977-014	EP2202977-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**113**	**128**	**163**	**148**	----
Total Alkalinity as CaCO3	----	1	mg/L		**113**	**128**	**163**	**148**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2730**	**2670**	**2760**	**2790**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20800**	**20600**	**20600**	**20900**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**488**	**515**	**532**	**502**	**556**
Magnesium	7439-95-4	1	mg/L		**1570**	**1660**	**1640**	**1560**	**1610**
Sodium	7440-23-5	1	mg/L		**12000**	**12700**	**12500**	**12100**	**12400**
Potassium	7440-09-7	1	mg/L		**633**	**673**	**670**	**637**	**662**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**646**	**639**	**642**	**651**	**657**
ø Total Cations	----	0.01	meq/L		**692**	**732**	**722**	**696**	**716**
ø Ionic Balance	----	0.01	%		**3.43**	**6.76**	**5.90**	**3.37**	**4.32**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	**0.06**	**0.07**	**0.19**	**0.01**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW341_220314	0089_PW363_220314	0089_PW369_220314	0089_PW345_220314	0089_PW367_220314
				Sampling date / time	14-Mar-2022 10:08	14-Mar-2022 10:27	14-Mar-2022 11:56	14-Mar-2022 12:28	14-Mar-2022 12:40
					EP2202977-010	EP2202977-011	EP2202977-012	EP2202977-014	EP2202977-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW341_220314	0089_PW363_220314	0089_PW369_220314	0089_PW345_220314	0089_PW367_220314
				Sampling date / time	14-Mar-2022 10:08	14-Mar-2022 10:27	14-Mar-2022 11:56	14-Mar-2022 12:28	14-Mar-2022 12:40
Compound	CAS Number	LOR	Unit		EP2202977-010	EP2202977-011	EP2202977-012	EP2202977-014	EP2202977-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	**0.06**	**0.07**	**0.19**	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.06**	**0.07**	**0.19**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**0.06**	**0.07**	**0.19**	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.0**	**89.3**	**92.4**	**96.3**	**87.4**
13C8-PFOA	----	0.02	%		**106**	**108**	**110**	**104**	**102**

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2202977**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35003	Issue Date	: 22-Mar-2022
Sampler	: [redacted]		
Site	: DEF19009/Stirling SW/PW JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4233405)									
EP2202976-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	488	491	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	488	491	0.5	0% - 20%
EP2202977-009	0089_QC107_220314	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	121	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	121	1.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4234053)									
EP2202977-001	0089_SW130_220314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2690	2660	1.2	0% - 20%
EP2202977-011	0089_PW363_220314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2670	2640	1.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4234052)									
EP2202977-001	0089_SW130_220314	ED045G: Chloride	16887-00-6	1	mg/L	20100	20000	0.8	0% - 20%
EP2202977-011	0089_PW363_220314	ED045G: Chloride	16887-00-6	1	mg/L	20600	20700	0.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4232910)									
EP2202975-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	103	105	2.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	51	52	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	166	168	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EP2202977-004	0089_QC101_220314	ED093F: Calcium	7440-70-2	1	mg/L	494	478	3.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1590	1540	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12100	11800	2.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	644	625	3.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4232911)									
EP2202977-014	0089_PW345_220314	ED093F: Calcium	7440-70-2	1	mg/L	502	513	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1560	1610	2.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12100	12300	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	637	660	3.6	0% - 20%
EP2203043-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	43	41	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	41	40	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	296	294	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	11	11	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4239427)									
EP2202977-002	0089_PW335_220314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4239427)									
EP2202977-002	0089_PW335_220314	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4239427)									
EP2202977-002	0089_PW335_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4239427) - continued									
EP2202977-002	0089_PW335_220314	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4239427)									
EP2202977-002	0089_PW335_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4239427)									
EP2202977-002	0089_PW335_220314	EP231X: Sum of PFAS	----	0.01	µg/L	0.05	0.05	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4233405)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	111	81.2	126
				<1	200 mg/L	101	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234053)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	87.7	113
				<1	500 mg/L	106	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4234052)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	87.9	114
				<1	1000 mg/L	107	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4232910)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.6	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.6	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.2	89.7	108
ED093F: Dissolved Major Cations (QCLot: 4232911)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.6	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.6	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.0	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239427)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	94.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	97.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	87.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	83.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239427)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239427) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	109	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	103	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	78.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239427)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	91.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	76.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	111	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	89.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	82.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239427)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	95.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	81.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	77.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234053)							
EP2202977-001	0089_SW130_220314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4234052)							
EP2202977-001	0089_SW130_220314	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239427)							
EP2202977-012	0089_PW369_220314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	96.4	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	96.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	99.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	90.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	92.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	95.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239427)							
EP2202977-012	0089_PW369_220314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.6	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	101	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	117	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	98.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	119	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	107	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	97.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	88.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239427)							
EP2202977-012	0089_PW369_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	89.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	109	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	80.3	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	114	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.7	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	76.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239427)							
EP2202977-012	0089_PW369_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	93.4	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	88.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	99.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	86.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2202977**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Site	: DEF19009/Stirling SW/PW JS	Issue Date	: 22-Mar-2022
Sampler	: [redacted]	No. of samples received	: 15
Order number	: DEF19009/730	No. of samples analysed	: 15

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2202977--001	0089_SW130_220314	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2202977--001	0089_SW130_220314	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	20	5.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW130_220314, 0089_PW335_220314, 0089_PW364_220314, 0089_QC101_220314, 0089_SW132_220314, 0089_PW340_220314, 0089_PW362_220314, 0089_SW134_220314, 0089_QC107_220314, 0089_PW341_220314, 0089_PW363_220314, 0089_PW369_220314, 0089_SW370_220314, 0089_PW345_220314	**14-Mar-2022**	**----**	----	----	**17-Mar-2022**	28-Mar-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW130_220314, 0089_PW335_220314, 0089_PW364_220314, 0089_QC101_220314, 0089_SW132_220314, 0089_PW340_220314, 0089_PW362_220314, 0089_SW134_220314, 0089_QC107_220314, 0089_PW341_220314, 0089_PW363_220314, 0089_PW369_220314, 0089_SW370_220314, 0089_PW345_220314	**14-Mar-2022**	**----**	----	----	**18-Mar-2022**	11-Apr-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW130_220314, 0089_PW335_220314, 0089_PW364_220314, 0089_QC101_220314, 0089_SW132_220314, 0089_PW340_220314, 0089_PW362_220314, 0089_SW134_220314, 0089_QC107_220314, 0089_PW341_220314, 0089_PW363_220314, 0089_PW369_220314, 0089_SW370_220314, 0089_PW345_220314	**14-Mar-2022**	**----**	----	----	**18-Mar-2022**	11-Apr-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW130_220314, 0089_PW335_220314, 0089_PW364_220314, 0089_QC101_220314, 0089_SW132_220314, 0089_PW340_220314, 0089_PW362_220314, 0089_SW134_220314, 0089_QC107_220314, 0089_PW341_220314, 0089_PW363_220314, 0089_PW369_220314, 0089_SW370_220314, 0089_PW345_220314, 0089_PW367_220314	**14-Mar-2022**	**----**	----	----	**17-Mar-2022**	21-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW130_220314, 0089_PW335_220314, 0089_PW364_220314, 0089_QC101_220314, 0089_SW132_220314, 0089_PW340_220314, 0089_PW362_220314, 0089_SW134_220314, 0089_QC107_220314, 0089_PW341_220314, 0089_PW363_220314, 0089_PW369_220314, 0089_SW370_220314, 0089_PW345_220314, 0089_PW367_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW130_220314, 0089_PW335_220314, 0089_PW364_220314, 0089_QC101_220314, 0089_SW132_220314, 0089_PW340_220314, 0089_PW362_220314, 0089_SW134_220314, 0089_QC107_220314, 0089_PW341_220314, 0089_PW363_220314, 0089_PW369_220314, 0089_SW370_220314, 0089_PW345_220314, 0089_PW367_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW130_220314, 0089_PW335_220314, 0089_PW364_220314, 0089_QC101_220314, 0089_SW132_220314, 0089_PW340_220314, 0089_PW362_220314, 0089_SW134_220314, 0089_QC107_220314, 0089_PW341_220314, 0089_PW363_220314, 0089_PW369_220314, 0089_SW370_220314, 0089_PW345_220314, 0089_PW367_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW130_220314, 0089_PW335_220314, 0089_PW364_220314, 0089_QC101_220314, 0089_SW132_220314, 0089_PW340_220314, 0089_PW362_220314, 0089_SW134_220314, 0089_QC107_220314, 0089_PW341_220314, 0089_PW363_220314, 0089_PW369_220314, 0089_SW370_220314, 0089_PW345_220314, 0089_PW367_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW130_220314, 0089_PW335_220314, 0089_PW364_220314, 0089_QC101_220314, 0089_SW132_220314, 0089_PW340_220314, 0089_PW362_220314, 0089_SW134_220314, 0089_QC107_220314, 0089_PW341_220314, 0089_PW363_220314, 0089_PW369_220314, 0089_SW370_220314, 0089_PW345_220314, 0089_PW367_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**21-Mar-2022**	10-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **35006** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] DATE TIME: 15/3 12pm	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? (Yes) No N/A

Free ice / frozen ice bricks present upon receipt? (Yes) No N/A

Random Sample Temperature on Receipt: 17.0 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD335		14/03/2022 08:27 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_SD364		14/03/2022 08:43 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD340		14/03/2022 09:16 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD362		14/03/2022 09:37 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
005	0089_SD341		14/03/2022 10:08 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
006	0089_SD363		14/03/2022 10:26 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
007	0089_SD369		14/03/2022 11:57 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
008	0089_QC109		14/03/2022 11:59 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
009	0089_SD345		14/03/2022 12:29 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

Environmental Division
Perth

Work Order Reference
EP2202978

Telephone : - 61-8-9406 1301

CHAIN OF CUSTODY

COC#: **35006** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SD367		14/03/2022 12:42 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
011	0089_QC110		14/03/2022 12:42 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

COC#: **35006** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD335	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_SD364	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD340	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD362	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0089_SD341	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0089_SD363	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
007	0089_SD369	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
008	0089_QC109	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
009	0089_SD345	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
010	0089_SD367	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
011	0089_QC110	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **35006** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED JS

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD335	HDPE Soil Jar	200 mL	00621019097679	Grey	No	
002	0089_SD364	HDPE Soil Jar	200 mL	00621019083917	Grey	No	
003	0089_SD340	HDPE Soil Jar	200 mL	00621019083911	Grey	No	
004	0089_SD362	HDPE Soil Jar	200 mL	00621019074613	Grey	No	
005	0089_SD341	HDPE Soil Jar	200 mL	00621019074576	Grey	No	
006	0089_SD363	HDPE Soil Jar	200 mL	00621019054131	Grey	No	
007	0089_SD369	HDPE Soil Jar	200 mL	00620719052864	Grey	No	
008	0089_QC109	HDPE Soil Jar	200 mL	00621019107810	Grey	No	
009	0089_SD345	HDPE Soil Jar	200 mL	00621019107815	Grey	No	
010	0089_SD367	HDPE Soil Jar	200 mL	00621019097669	Grey	No	
011	0089_QC110	HDPE Soil Jar	200 mL	00620719052816	Grey	No	

Total Bottle Count: ALS: 11, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2202978**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 35006	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2022 12:00	Issue Date	: 16-Mar-2022
Client Requested Due Date	: 25-Mar-2022	Scheduled Reporting Date	: **25-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 17.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2202978-001	14-Mar-2022 08:27	0089_SD335_220314	✓	✓
EP2202978-002	14-Mar-2022 08:43	0089_SD364_220314	✓	✓
EP2202978-003	14-Mar-2022 09:16	0089_SD340_220314	✓	✓
EP2202978-004	14-Mar-2022 09:37	0089_SD362_220314	✓	✓
EP2202978-005	14-Mar-2022 10:08	0089_SD341_220314	✓	✓
EP2202978-006	14-Mar-2022 10:26	0089_SD363_220314	✓	✓
EP2202978-007	14-Mar-2022 11:57	0089_SD369_220314	✓	✓
EP2202978-008	14-Mar-2022 11:59	0089_QC109_220314	✓	✓
EP2202978-009	14-Mar-2022 12:29	0089_SD345_220314	✓	✓
EP2202978-010	14-Mar-2022 12:42	0089_SD367_220314	✓	✓
EP2202978-011	14-Mar-2022 12:42	0089_QC110_220314	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2202978**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022 12:00
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35006	Issue Date	: 24-Mar-2022 10:57
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD335_220314	0089_SD364_220314	0089_SD340_220314	0089_SD362_220314	0089_SD341_220314
				Sampling date / time	14-Mar-2022 08:27	14-Mar-2022 08:43	14-Mar-2022 09:16	14-Mar-2022 09:37	14-Mar-2022 10:08
					EP2202978-001	EP2202978-002	EP2202978-003	EP2202978-004	EP2202978-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**26.0**	**28.9**	**26.6**	**26.2**	**26.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_220314	0089_SD364_220314	0089_SD340_220314	0089_SD362_220314	0089_SD341_220314
				Sampling date / time	14-Mar-2022 08:27	14-Mar-2022 08:43	14-Mar-2022 09:16	14-Mar-2022 09:37	14-Mar-2022 10:08
Compound	CAS Number	LOR	Unit		EP2202978-001	EP2202978-002	EP2202978-003	EP2202978-004	EP2202978-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**99.0**	**99.5**	**104**	**99.0**	**91.0**
13C8-PFOA	----	0.0002	%		**102**	**104**	**104**	**102**	**101**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD363_220314	0089_SD369_220314	0089_QC109_220314	0089_SD345_220314	0089_SD367_220314
			Sampling date / time	14-Mar-2022 10:26	14-Mar-2022 11:57	14-Mar-2022 11:59	14-Mar-2022 12:29	14-Mar-2022 12:42
Compound	CAS Number	LOR	Unit	EP2202978-006	EP2202978-007	EP2202978-008	EP2202978-009	EP2202978-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**23.8**	**31.4**	**37.5**	**34.2**	**32.8**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	**0.0005**	**0.0006**	<0.0002	**0.0006**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD363_220314	0089_SD369_220314	0089_QC109_220314	0089_SD345_220314	0089_SD367_220314
				Sampling date / time	14-Mar-2022 10:26	14-Mar-2022 11:57	14-Mar-2022 11:59	14-Mar-2022 12:29	14-Mar-2022 12:42
Compound	CAS Number	LOR	Unit		EP2202978-006	EP2202978-007	EP2202978-008	EP2202978-009	EP2202978-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0005**	**0.0006**	<0.0002	**0.0006**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0005**	**0.0006**	<0.0002	**0.0006**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**0.0005**	**0.0006**	<0.0002	**0.0006**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**95.0**	**100**	**120**	**107**
13C8-PFOA	----	0.0002	%		**106**	**95.5**	**100**	**112**	**101**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_QC110_220314	----	----	----	----
			Sampling date / time	14-Mar-2022 12:42	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2202978-011	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**33.4**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0006**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_QC110_220314	----	----	----	----
				Sampling date / time	14-Mar-2022 12:42	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2202978-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0006**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0006**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0006**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**99.5**	----	----	----	----
13C8-PFOA	----	0.0002	%		**101**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2202978**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35006	Issue Date	: 24-Mar-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4244067)									
EP2202978-003	0089_SD340_220314	EA055: Moisture Content	----	0.1	%	26.6	24.5	8.3	0% - 20%
EP2203020-003	Anonymous	EA055: Moisture Content	----	0.1	%	27.8	27.4	1.3	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4241128)									
EP2202978-001	0089_SD335_220314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2202978-011	0089_QC110_220314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0006	0.0005	19.4	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4241128)									
EP2202978-001	0089_SD335_220314	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4241128) - continued									
EP2202978-001	0089_SD335_220314	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2202978-011	0089_QC110_220314	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4241128)									
EP2202978-001	0089_SD335_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2202978-011	0089_QC110_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4241128)									
EP2202978-001	0089_SD335_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2202978-011	0089_QC110_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4241128)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4241128)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	92.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	68.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4241128)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.1	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4241128)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	89.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	89.6	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4241128) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	78.8	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4241128)							
EP2202978-001	0089_SD335_220314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	97.2	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	84.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	87.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	91.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	101	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	87.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4241128)							
EP2202978-001	0089_SD335_220314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	89.0	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	120	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	92.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	103	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	101	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	96.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	107	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	90.0	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	85.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	105	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4241128)							
EP2202978-001	0089_SD335_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	102	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	99.2	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	93.4	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	98.2	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	98.4	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	95.6	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4241128) - continued							
EP2202978-001	0089_SD335_220314	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	78.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4241128)							
EP2202978-001	0089_SD335_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	96.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	117	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	94.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	89.2	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2202978**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Site	: DEF19009/Stirling SED JS	Issue Date	: 24-Mar-2022
Sampler	: [redacted]	No. of samples received	: 11
Order number	: DEF19009/730	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD335_220314, 0089_SD364_220314, 0089_SD340_220314, 0089_SD362_220314, 0089_SD341_220314, 0089_SD363_220314, 0089_SD369_220314, 0089_QC109_220314, 0089_SD345_220314, 0089_SD367_220314, 0089_QC110_220314	**14-Mar-2022**	**----**	----	----	**23-Mar-2022**	28-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_220314, 0089_SD364_220314, 0089_SD340_220314, 0089_SD362_220314, 0089_SD341_220314, 0089_SD363_220314, 0089_SD369_220314, 0089_QC109_220314, 0089_SD345_220314, 0089_SD367_220314, 0089_QC110_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	01-May-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_220314, 0089_SD364_220314, 0089_SD340_220314, 0089_SD362_220314, 0089_SD341_220314, 0089_SD363_220314, 0089_SD369_220314, 0089_QC109_220314, 0089_SD345_220314, 0089_SD367_220314, 0089_QC110_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	01-May-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD335_220314, 0089_SD364_220314, 0089_SD340_220314, 0089_SD362_220314, 0089_SD341_220314, 0089_SD363_220314, 0089_SD369_220314, 0089_QC109_220314, 0089_SD345_220314, 0089_SD367_220314, 0089_QC110_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	01-May-2022	✓

Matrix: **SOIL**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_220314, 0089_SD364_220314, 0089_SD340_220314, 0089_SD362_220314, 0089_SD341_220314, 0089_SD363_220314, 0089_SD369_220314, 0089_QC109_220314, 0089_SD345_220314, 0089_SD367_220314, 0089_QC110_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	01-May-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD335_220314, 0089_SD364_220314, 0089_SD340_220314, 0089_SD362_220314, 0089_SD341_220314, 0089_SD363_220314, 0089_SD369_220314, 0089_QC109_220314, 0089_SD345_220314, 0089_SD367_220314, 0089_QC110_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	01-May-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ▯ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: 35028 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] DATE TIME: 15/3 12pm	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? (Yes) No N/A

Free ice / frozen ice bricks present upon receipt? (Yes) No N/A

Random Sample Temperature on Receipt: 17.0 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD351		14/03/2022 04:39 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_SD350		14/03/2022 04:39 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD381		14/03/2022 04:39 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD401		14/03/2022 04:40 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
005	0089_SD352		14/03/2022 04:40 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
006	0089_SD380		14/03/2022 04:41 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

Environmental Division Perth

Work Order Reference

EP2202979

Telephone : -- 61-8-9406 1301

CHAIN OF CUSTODY

COC#: 35028 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD351	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_SD350	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD381	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD401	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0089_SD352	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0089_SD380	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 35028 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED MB

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD351	HDPE Soil Jar	200 mL	00621019032895	Grey	No	
002	0089_SD350	HDPE Soil Jar	200 mL	00620719052857	Grey	No	
003	0089_SD381	HDPE Soil Jar	200 mL	00621019074704	Grey	No	
004	0089_SD401	HDPE Soil Jar	200 mL	00620719052801	Grey	No	
005	0089_SD352	HDPE Soil Jar	200 mL	00621019074567	Grey	No	
006	0089_SD380	HDPE Soil Jar	200 mL	00621019074686	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2202979**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 35028	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2022 12:00	Issue Date	: 16-Mar-2022
Client Requested Due Date	: 24-Mar-2022	Scheduled Reporting Date	: **24-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 17.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2202979-001	14-Mar-2022 16:39	0089_SD351_220314	✓	✓
EP2202979-002	14-Mar-2022 16:39	0089_SD350_220314	✓	✓
EP2202979-003	14-Mar-2022 16:39	0089_SD381_220314	✓	✓
EP2202979-004	14-Mar-2022 16:40	0089_SD401_220314	✓	✓
EP2202979-005	14-Mar-2022 16:40	0089_SD352_220314	✓	✓
EP2202979-006	14-Mar-2022 16:41	0089_SD380_220314	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2202979**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022 12:00
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35028	Issue Date	: 24-Mar-2022 10:57
Sampler	: [redacted]		
Site	: DEF19009/Stirling SED MB		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD351_220314	0089_SD350_220314	0089_SD381_220314	0089_SD401_220314	0089_SD352_220314
				Sampling date / time	14-Mar-2022 16:39	14-Mar-2022 16:39	14-Mar-2022 16:39	14-Mar-2022 16:40	14-Mar-2022 16:40
					EP2202979-001	EP2202979-002	EP2202979-003	EP2202979-004	EP2202979-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**8.5**	**12.6**	**8.4**	**24.7**	**10.6**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD351_220314	0089_SD350_220314	0089_SD381_220314	0089_SD401_220314	0089_SD352_220314
				Sampling date / time	14-Mar-2022 16:39	14-Mar-2022 16:39	14-Mar-2022 16:39	14-Mar-2022 16:40	14-Mar-2022 16:40
Compound	CAS Number	LOR	Unit		EP2202979-001	EP2202979-002	EP2202979-003	EP2202979-004	EP2202979-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**88.5**	**89.5**	**99.0**	**99.5**	**93.5**
13C8-PFOA	----	0.0002	%		**92.5**	**92.0**	**90.5**	**89.5**	**93.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD380_220314	----	----	----	----
			Sampling date / time	14-Mar-2022 16:41	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2202979-006	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**19.9**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD380_220314	----	----	----	----
				Sampling date / time	14-Mar-2022 16:41	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2202979-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	----	----	----	----
13C8-PFOA	----	0.0002	%		**89.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2202979**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35028	Issue Date	: 24-Mar-2022
Sampler	: [redacted]		
Site	: DEF19009/Stirling SED MB		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4243126)									
EP2202979-003	0089_SD381_220314	EA055: Moisture Content	----	0.1	%	8.4	8.0	5.1	0% - 20%
ES2209541-012	Anonymous	EA055: Moisture Content	----	0.1	%	15.1	17.8	16.4	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4241113)									
EP2202979-001	0089_SD351_220314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2206208-015	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4241113)									
EP2202979-001	0089_SD351_220314	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4241113) - continued									
EP2202979-001	0089_SD351_220314	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2206208-015	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4241113)									
EP2202979-001	0089_SD351_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2206208-015	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4241113)									
EP2202979-001	0089_SD351_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2206208-015	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4241113)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	71.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4241113)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	98.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	130	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4241113)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.8	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.8	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.7	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4241113)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	82.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	73.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	76.0	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4241113) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	76.8	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4241113)							
EP2202979-001	0089_SD351_220314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	119	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	86.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	77.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	91.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	101	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	94.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4241113)							
EP2202979-001	0089_SD351_220314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	134	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	94.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	126	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	101	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	108	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	118	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	113	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	94.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	114	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	112	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	121	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4241113)							
EP2202979-001	0089_SD351_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	86.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	93.3	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	108	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	110	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	97.6	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4241113) - continued							
EP2202979-001	0089_SD351_220314	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	93.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4241113)							
EP2202979-001	0089_SD351_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	115	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	86.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	95.2	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2202979**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Site	: DEF19009/Stirling SED MB	Issue Date	: 24-Mar-2022
Sampler	: [redacted]	No. of samples received	: 6
Order number	: DEF19009/730	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD351_220314, 0089_SD350_220314, 0089_SD381_220314, 0089_SD401_220314, 0089_SD352_220314, 0089_SD380_220314	**14-Mar-2022**	**----**	----	----	**22-Mar-2022**	28-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD351_220314, 0089_SD350_220314, 0089_SD381_220314, 0089_SD401_220314, 0089_SD352_220314, 0089_SD380_220314	**14-Mar-2022**	**23-Mar-2022**	10-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD351_220314, 0089_SD350_220314, 0089_SD381_220314, 0089_SD401_220314, 0089_SD352_220314, 0089_SD380_220314	**14-Mar-2022**	**23-Mar-2022**	10-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD351_220314, 0089_SD350_220314, 0089_SD381_220314, 0089_SD401_220314, 0089_SD352_220314, 0089_SD380_220314	**14-Mar-2022**	**23-Mar-2022**	10-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD351_220314, 0089_SD350_220314, 0089_SD381_220314, 0089_SD401_220314, 0089_SD352_220314, 0089_SD380_220314	**14-Mar-2022**	**23-Mar-2022**	10-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD351_220314, 0089_SD350_220314, 0089_SD381_220314, 0089_SD401_220314, 0089_SD352_220314, 0089_SD380_220314	**14-Mar-2022**	**23-Mar-2022**	10-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ▯ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: **35029** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/3 12pm	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? (Yes) No N/A

Free ice / frozen ice bricks present upon receipt? (Yes) No N/A

Random Sample Temperature on Receipt: 17.0 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW351		14/03/2022 04:42 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_SW382		14/03/2022 04:43 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW401		14/03/2022 04:44 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_PW350		14/03/2022 04:44 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_SW353		14/03/2022 04:45 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW382		14/03/2022 04:46 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW380		14/03/2022 04:48 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_SW384		14/03/2022 04:49 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_PW352		14/03/2022 04:50 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

Environmental Division
Perth

Work Order Reference
EP2202980

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

COC#: 35029 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW351	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW382	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW401	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW350	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW353	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW382	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW380	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_SW384	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW352	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **35029** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW351	Clear Plastic Bottle - Natural	250 mL	00070621079281	Green	No	
001	0089_PW351	HDPE (no PTFE)	20 mL	00350821044865	Grey	No	
001	0089_PW351	HDPE (no PTFE)	20 mL	00350821044869	Grey	No	
002	0089_SW382	Clear Plastic Bottle - Natural	250 mL	00070621079333	Green	No	
002	0089_SW382	HDPE (no PTFE)	20 mL	00350821044854	Grey	No	
002	0089_SW382	HDPE (no PTFE)	20 mL	00350821044929	Grey	No	
003	0089_PW401	Clear Plastic Bottle - Natural	250 mL	00070621079231	Green	No	
003	0089_PW401	HDPE (no PTFE)	20 mL	00350821044907	Grey	No	
003	0089_PW401	HDPE (no PTFE)	20 mL	00350821044918	Grey	No	
004	0089_PW350	Clear Plastic Bottle - Natural	250 mL	00070621079314	Green	No	
004	0089_PW350	HDPE (no PTFE)	20 mL	00350821044878	Grey	No	
004	0089_PW350	HDPE (no PTFE)	20 mL	00350821044945	Grey	No	
005	0089_SW353	Clear Plastic Bottle - Natural	250 mL	00070621079240	Green	No	
005	0089_SW353	HDPE (no PTFE)	20 mL	00350821044936	Grey	No	
005	0089_SW353	HDPE (no PTFE)	20 mL	00350821044783	Grey	No	
006	0089_PW382	Clear Plastic Bottle - Natural	250 mL	00070621079325	Green	No	
006	0089_PW382	HDPE (no PTFE)	20 mL	00350821044903	Grey	No	
006	0089_PW382	HDPE (no PTFE)	20 mL	00350821044924	Grey	No	
007	0089_PW380	Clear Plastic Bottle - Natural	250 mL	00070621079269	Green	No	
007	0089_PW380	HDPE (no PTFE)	20 mL	00350821044892	Grey	No	
007	0089_PW380	HDPE (no PTFE)	20 mL	00350621043691	Grey	No	
008	0089_SW384	Clear Plastic Bottle - Natural	250 mL	00070621079379	Green	No	
008	0089_SW384	HDPE (no PTFE)	20 mL	00350821044887	Grey	No	
008	0089_SW384	HDPE (no PTFE)	20 mL	00350821044938	Grey	No	
009	0089_PW352	Clear Plastic Bottle - Natural	250 mL	00070621079285	Green	No	
009	0089_PW352	HDPE (no PTFE)	20 mL	00350821044796	Grey	No	

CHAIN OF CUSTODY

COC#: **35029** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

009	0089_PW352	HDPE (no PTFE)	20 mL	00350821044870	Grey	No	

Total Bottle Count: ALS: 27, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2202980**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 35029	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2022 12:00	Issue Date	: 16-Mar-2022
Client Requested Due Date	: 23-Mar-2022	Scheduled Reporting Date	: **23-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 17.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2202980-001	14-Mar-2022 16:42	0089_PW351_220314	✓	✓	✓	✓
EP2202980-002	14-Mar-2022 16:43	0089_SW382_220314	✓	✓	✓	✓
EP2202980-003	14-Mar-2022 16:44	0089_PW401_220314	✓	✓	✓	✓
EP2202980-004	14-Mar-2022 16:44	0089_PW350_220314	✓	✓	✓	✓
EP2202980-005	14-Mar-2022 16:45	0089_SW353_220314	✓	✓	✓	✓
EP2202980-006	14-Mar-2022 16:46	0089_PW382_220314	✓	✓	✓	✓
EP2202980-007	14-Mar-2022 16:48	0089_PW380_220314	✓	✓	✓	✓
EP2202980-008	14-Mar-2022 16:49	0089_SW384_220314	✓	✓	✓	✓
EP2202980-009	14-Mar-2022 16:50	0089_PW352_220314	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2202980**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022 12:00
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35029	Issue Date	: 23-Mar-2022 17:15
Sampler	: [redacted]		
Site	: DEF19009/Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW351_220314	0089_SW382_220314	0089_SW353_220314	0089_SW384_220314	----
				Sampling date / time	14-Mar-2022 16:42	14-Mar-2022 16:43	14-Mar-2022 16:45	14-Mar-2022 16:49	----
Compound	CAS Number	LOR	Unit		EP2202980-001	EP2202980-002	EP2202980-005	EP2202980-008	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		119	120	120	121	----
Total Alkalinity as CaCO3	----	1	mg/L		119	120	120	121	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2630	2600	2700	2680	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19000	18600	18500	18600	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		478	476	448	482	----
Magnesium	7439-95-4	1	mg/L		1540	1550	1450	1560	----
Sodium	7440-23-5	1	mg/L		11700	11900	11000	12000	----
Potassium	7440-09-7	1	mg/L		619	628	580	634	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		593	581	580	583	----
ø Total Cations	----	0.01	meq/L		675	685	635	691	----
ø Ionic Balance	----	0.01	%		6.48	8.20	4.48	8.46	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW351_220314	0089_SW382_220314	0089_SW353_220314	0089_SW384_220314	----
				Sampling date / time	14-Mar-2022 16:42	14-Mar-2022 16:43	14-Mar-2022 16:45	14-Mar-2022 16:49	----
Compound	CAS Number	LOR	Unit		EP2202980-001	EP2202980-002	EP2202980-005	EP2202980-008	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW351_220314	0089_SW382_220314	0089_SW353_220314	0089_SW384_220314	----
				Sampling date / time	14-Mar-2022 16:42	14-Mar-2022 16:43	14-Mar-2022 16:45	14-Mar-2022 16:49	----
Compound	CAS Number	LOR	Unit		EP2202980-001	EP2202980-002	EP2202980-005	EP2202980-008	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**87.9**	**88.1**	**88.3**	**80.8**	----
13C8-PFOA	----	0.02	%		**108**	**112**	**117**	**120**	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW401_220314	0089_PW350_220314	0089_PW382_220314	0089_PW380_220314	0089_PW352_220314
				Sampling date / time	14-Mar-2022 16:44	14-Mar-2022 16:44	14-Mar-2022 16:46	14-Mar-2022 16:48	14-Mar-2022 16:50
					EP2202980-003	EP2202980-004	EP2202980-006	EP2202980-007	EP2202980-009
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**127**	**114**	**118**	**119**	**120**
Total Alkalinity as CaCO3	----	1	mg/L		**127**	**114**	**118**	**119**	**120**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2610**	**2210**	**2400**	**2710**	**2720**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18700**	**18600**	**18300**	**18300**	**19000**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**456**	**471**	**459**	**474**	**463**
Magnesium	7439-95-4	1	mg/L		**1480**	**1530**	**1490**	**1540**	**1500**
Sodium	7440-23-5	1	mg/L		**11400**	**11700**	**11100**	**11800**	**11400**
Potassium	7440-09-7	1	mg/L		**593**	**612**	**602**	**621**	**604**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**584**	**573**	**568**	**575**	**595**
ø Total Cations	----	0.01	meq/L		**656**	**674**	**644**	**680**	**658**
ø Ionic Balance	----	0.01	%		**5.74**	**8.10**	**6.20**	**8.33**	**5.02**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	**0.02**	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW401_220314	0089_PW350_220314	0089_PW382_220314	0089_PW380_220314	0089_PW352_220314
				Sampling date / time	14-Mar-2022 16:44	14-Mar-2022 16:44	14-Mar-2022 16:46	14-Mar-2022 16:48	14-Mar-2022 16:50
Compound	CAS Number	LOR	Unit		EP2202980-003	EP2202980-004	EP2202980-006	EP2202980-007	EP2202980-009
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW401_220314	0089_PW350_220314	0089_PW382_220314	0089_PW380_220314	0089_PW352_220314
				Sampling date / time	14-Mar-2022 16:44	14-Mar-2022 16:44	14-Mar-2022 16:46	14-Mar-2022 16:48	14-Mar-2022 16:50
Compound	CAS Number	LOR	Unit		EP2202980-003	EP2202980-004	EP2202980-006	EP2202980-007	EP2202980-009
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.01**	**0.02**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.02**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**0.02**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**87.6**	**82.1**	**83.8**	**86.1**	**80.1**
13C8-PFOA	----	0.02	%		**115**	**116**	**120**	**116**	**119**

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2202980**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35029	Issue Date	: 23-Mar-2022
Sampler	: [redacted]		
Site	: DEF19009/Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4233405)									
EP2202976-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	488	491	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	488	491	0.5	0% - 20%
EP2202977-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	121	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	121	1.1	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4233406)									
EP2202980-004	0089_PW350_220314	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	114	115	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	114	115	0.0	0% - 20%
EP2203018-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	430	431	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	430	431	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4234050)									
EP2202980-003	0089_PW401_220314	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2610	2600	0.4	0% - 20%
EP2202968-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	116	121	4.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4234051)									
EP2202980-003	0089_PW401_220314	ED045G: Chloride	16887-00-6	1	mg/L	18700	18700	0.0	0% - 20%
EP2202968-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	130	131	0.9	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4232911)									
EP2202977-014	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	502	513	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1560	1610	2.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12100	12300	1.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	637	660	3.6	0% - 20%
EP2203043-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	43	41	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	41	40	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	296	294	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	11	11	0.0	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4233405)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	111	81.2	126
				<1	200 mg/L	101	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4233406)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	81.2	126
				<1	200 mg/L	100	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234050)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.6	87.7	113
				<1	500 mg/L	94.7	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4234051)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	107	87.9	114
				<1	1000 mg/L	101	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4232911)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.6	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.6	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.0	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4239937)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	105	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	93.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	77.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239937)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4239937) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	107	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	70.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	119	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4239937)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	122	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	114	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	117	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	119	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	125	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4239937)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	116	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	110	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	84.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234050)							
EP2202968-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	120	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4234051)							
EP2202968-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	110	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2202980**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Site	: DEF19009/Stirling SW/PW - MB	Issue Date	: 23-Mar-2022
Sampler	: [redacted]	No. of samples received	: 9
Order number	: DEF19009/730	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	12	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	12	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW351_220314, 0089_SW382_220314, 0089_PW401_220314, 0089_PW350_220314, 0089_SW353_220314, 0089_PW382_220314, 0089_PW380_220314, 0089_SW384_220314, 0089_PW352_220314	**14-Mar-2022**	**----**	----	----	**17-Mar-2022**	28-Mar-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW351_220314, 0089_SW382_220314, 0089_PW401_220314, 0089_PW350_220314, 0089_SW353_220314, 0089_PW382_220314, 0089_PW380_220314, 0089_SW384_220314, 0089_PW352_220314	**14-Mar-2022**	**----**	----	----	**23-Mar-2022**	11-Apr-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW351_220314, 0089_SW382_220314, 0089_PW401_220314, 0089_PW350_220314, 0089_SW353_220314, 0089_PW382_220314, 0089_PW380_220314, 0089_SW384_220314, 0089_PW352_220314	**14-Mar-2022**	**----**	----	----	**23-Mar-2022**	11-Apr-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW351_220314, 0089_SW382_220314, 0089_PW401_220314, 0089_PW350_220314, 0089_SW353_220314, 0089_PW382_220314, 0089_PW380_220314, 0089_SW384_220314, 0089_PW352_220314	**14-Mar-2022**	**----**	----	----	**17-Mar-2022**	21-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW351_220314, 0089_SW382_220314, 0089_PW401_220314, 0089_PW350_220314, 0089_SW353_220314, 0089_PW382_220314, 0089_PW380_220314, 0089_SW384_220314, 0089_PW352_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW351_220314, 0089_SW382_220314, 0089_PW401_220314, 0089_PW350_220314, 0089_SW353_220314, 0089_PW382_220314, 0089_PW380_220314, 0089_SW384_220314, 0089_PW352_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW351_220314, 0089_SW382_220314, 0089_PW401_220314, 0089_PW350_220314, 0089_SW353_220314, 0089_PW382_220314, 0089_PW380_220314, 0089_SW384_220314, 0089_PW352_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW351_220314, 0089_SW382_220314, 0089_PW401_220314, 0089_PW350_220314, 0089_SW353_220314, 0089_PW382_220314, 0089_PW380_220314, 0089_SW384_220314, 0089_PW352_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW351_220314, 0089_SW382_220314, 0089_PW401_220314, 0089_PW350_220314, 0089_SW353_220314, 0089_PW382_220314, 0089_PW380_220314, 0089_SW384_220314, 0089_PW352_220314	**14-Mar-2022**	**21-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	12	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	12	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 35072 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW195S		15/03/2022 08:50 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_QC111		15/03/2022 08:52 AM	Water	ALS: 3 Non ALS: 0	No		X		use green bottle for lab QC
003	0089_MW195D		15/03/2022 08:53 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW173		15/03/2022 09:33 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW193		15/03/2022 09:39 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW158		15/03/2022 10:29 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_MW161		15/03/2022 10:44 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_MW166		15/03/2022 11:01 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra pfas bottles for lab QC
009	0089_MW171		15/03/2022 11:17 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

(ALS) COC#: 35072 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW142		15/03/2022 02:23 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
011	0089_MW141		15/03/2022 02:42 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
012	0089_MW149		15/03/2022 02:44 PM	Water	ALS: 3 Non ALS: 0	No	Partial 3/8			
013	0089_MW139		15/03/2022 03:15 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

ALS COC#: 35072 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW195S	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW195D	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW173	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW193	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW158	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW161	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW166	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW171	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_MW142	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 35072 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

011	0089_MW141	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW149	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_MW139	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 35072 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW195S	HDPE (no PTFE)	20 mL	00350621043702	Grey	No	
001	0089_MW195S	HDPE (no PTFE)	20 mL	00350621043678	Grey	No	
001	0089_MW195S	Clear Plastic Bottle - Natural	250 mL	00070621079704	Green	No	
002	0089_QC111	Clear Plastic Bottle - Natural	250 mL	00070621079878	Green	No	
002	0089_QC111	HDPE (no PTFE)	20 mL	00350621043767	Grey	No	
002	0089_QC111	HDPE (no PTFE)	20 mL	00350621043760	Grey	No	
003	0089_MW195D	Clear Plastic Bottle - Natural	250 mL	00070621079213	Green	No	
003	0089_MW195D	HDPE (no PTFE)	20 mL	00350821044937	Grey	No	
003	0089_MW195D	HDPE (no PTFE)	20 mL	00350621043783	Grey	No	
004	0089_MW173	HDPE (no PTFE)	20 mL	00350621043749	Grey	No	
004	0089_MW173	Clear Plastic Bottle - Natural	250 mL	00070621079677	Green	No	
004	0089_MW173	HDPE (no PTFE)	20 mL	00350821044801	Grey	No	
005	0089_MW193	Clear Plastic Bottle - Natural	250 mL	00070621079304	Green	No	
005	0089_MW193	HDPE (no PTFE)	20 mL	00350621043750	Grey	No	
005	0089_MW193	HDPE (no PTFE)	20 mL	00350821044908	Grey	No	
006	0089_MW158	Clear Plastic Bottle - Natural	250 mL	00070621079680	Green	No	
006	0089_MW158	HDPE (no PTFE)	20 mL	00350621043733	Grey	No	
006	0089_MW158	HDPE (no PTFE)	20 mL	00350621043695	Grey	No	
007	0089_MW161	Clear Plastic Bottle - Natural	250 mL	00070621079717	Green	No	
007	0089_MW161	HDPE (no PTFE)	20 mL	00350621043679	Grey	No	
007	0089_MW161	HDPE (no PTFE)	20 mL	00350621043712	Grey	No	
008	0089_MW166	Clear Plastic Bottle - Natural	250 mL	00070621079932	Green	No	
008	0089_MW166	HDPE (no PTFE)	20 mL	00350621046725	Grey	No	
008	0089_MW166	HDPE (no PTFE)	20 mL	00350621046802	Grey	No	
008	0089_MW166	HDPE (no PTFE)	20 mL	00350621043739	Grey	No	
008	0089_MW166	HDPE (no PTFE)	20 mL	00350621043719	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 35072 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - MB

ORDER NO: DEF19009/730

PROJECT MANAGE[redacted]
PRIMARY SAMPLER

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW171	Clear Plastic Bottle - Natural	250 mL	00070621080031	Green	No	
009	0089_MW171	HDPE (no PTFE)	20 mL	00350621043688	Grey	No	
009	0089_MW171	HDPE (no PTFE)	20 mL	00350621043685	Grey	No	
010	0089_MW142	Clear Plastic Bottle - Natural	250 mL	00070621079282	Green	No	
010	0089_MW142	HDPE (no PTFE)	20 mL	00350821044760	Grey	No	
010	0089_MW142	HDPE (no PTFE)	20 mL	00350821044750	Grey	No	
011	0089_MW141	HDPE (no PTFE)	20 mL	00352101071837	Grey	No	
011	0089_MW141	Clear Plastic Bottle - Natural	250 mL	00070621079318	Green	No	
011	0089_MW141	HDPE (no PTFE)	20 mL	00350821044821	Grey	No	
011	0089_MW141	HDPE (no PTFE)	20 mL	00350821044926	Grey	No	
011	0089_MW141	HDPE (no PTFE)	20 mL	00352101070971	Grey	No	
012	0089_MW149	Clear Plastic Bottle - Natural	250 mL	00070621079210	Green	No	
012	0089_MW149	HDPE (no PTFE)	20 mL	00350621043735	Grey	No	
012	0089_MW149	HDPE (no PTFE)	20 mL	00350621043761	Grey	No	
013	0089_MW139	Clear Plastic Bottle - Natural	250 mL	00070621079313	Green	No	
013	0089_MW139	HDPE (no PTFE)	20 mL	00350821044817	Grey	No	
013	0089_MW139	HDPE (no PTFE)	20 mL	00350821044791	Grey	No	

Total Bottle Count: ALS: 43, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203018**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 35072	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2022 16:20	Issue Date	: 16-Mar-2022
Client Requested Due Date	: 25-Mar-2022	Scheduled Reporting Date	: **25-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 13 / 13

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2203018-001	15-Mar-2022 08:50	0089_MW195S_220315	✓	✓	✓	✓
EP2203018-002	15-Mar-2022 08:52	0089_QC111_220315		✓		
EP2203018-003	15-Mar-2022 08:53	0089_MW195D_220315	✓	✓	✓	✓
EP2203018-004	15-Mar-2022 09:33	0089_MW173_220315	✓	✓	✓	✓
EP2203018-005	15-Mar-2022 09:39	0089_MW193_220315	✓	✓	✓	✓
EP2203018-006	15-Mar-2022 10:29	0089_MW158_220315	✓	✓	✓	✓
EP2203018-007	15-Mar-2022 10:44	0089_MW161_220315	✓	✓	✓	✓
EP2203018-008	15-Mar-2022 11:01	0089_MW166_220315	✓	✓	✓	✓
EP2203018-009	15-Mar-2022 11:17	0089_MW171_220315	✓	✓	✓	✓
EP2203018-010	15-Mar-2022 14:23	0089_MW142_220315	✓	✓	✓	✓
EP2203018-011	15-Mar-2022 14:42	0089_MW141_220315	✓	✓	✓	✓
EP2203018-012	15-Mar-2022 14:44	0089_MW149_220315	✓	✓		✓
EP2203018-013	15-Mar-2022 15:15	0089_MW139_220315	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203018**	Page	: 1 of 12
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022 16:20
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35072	Issue Date	: 23-Mar-2022 13:54
Sampler	: [redacted]		
Site	: DEF19009/Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 13		
No. of samples analysed	: 13		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW195S_220315	0089_QC111_220315	0089_MW195D_220315	0089_MW173_220315	0089_MW193_220315
				Sampling date / time	15-Mar-2022 08:50	15-Mar-2022 08:52	15-Mar-2022 08:53	15-Mar-2022 09:33	15-Mar-2022 09:39
Compound	CAS Number	LOR	Unit		EP2203018-001	EP2203018-002	EP2203018-003	EP2203018-004	EP2203018-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		574	----	182	378	492
Total Alkalinity as CaCO3	----	1	mg/L		574	----	182	378	492
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		309	----	1480	269	203
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1040	----	10200	1040	829
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		198	----	389	110	132
Magnesium	7439-95-4	1	mg/L		147	----	814	98	118
Sodium	7440-23-5	1	mg/L		556	----	5580	640	461
Potassium	7440-09-7	1	mg/L		47	----	279	46	34
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		47.2	----	322	42.5	37.4
ø Total Cations	----	0.01	meq/L		47.4	----	336	42.6	37.2
ø Ionic Balance	----	0.01	%		0.13	----	2.14	0.09	0.30
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	0.35	1.11
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	0.28	1.42
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	0.02	4.21	11.9
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	0.51	0.52
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	5.42	1.86
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	0.2
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	0.04	0.18	0.46
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	0.04	0.88	3.19

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW195S_220315	0089_QC111_220315	0089_MW195D_220315	0089_MW173_220315	0089_MW193_220315
				Sampling date / time	15-Mar-2022 08:50	15-Mar-2022 08:52	15-Mar-2022 08:53	15-Mar-2022 09:33	15-Mar-2022 09:39
Compound	CAS Number	LOR	Unit		EP2203018-001	EP2203018-002	EP2203018-003	EP2203018-004	EP2203018-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.04**	**0.15**	**0.24**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.45**	**0.74**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	**0.08**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW195S_220315	0089_QC111_220315	0089_MW195D_220315	0089_MW173_220315	0089_MW193_220315
				Sampling date / time	15-Mar-2022 08:50	15-Mar-2022 08:52	15-Mar-2022 08:53	15-Mar-2022 09:33	15-Mar-2022 09:39
					EP2203018-001	EP2203018-002	EP2203018-003	EP2203018-004	EP2203018-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**0.14**	**12.5**	**21.6**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.02**	**9.63**	**13.8**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.14**	**11.7**	**19.7**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**108**	**102**	**100**	**97.9**
13C8-PFOA	----	0.02	%		**106**	**106**	**110**	**114**	**112**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW158_220315	0089_MW161_220315	0089_MW166_220315	0089_MW171_220315	0089_MW142_220315
				Sampling date / time	15-Mar-2022 10:29	15-Mar-2022 10:44	15-Mar-2022 11:01	15-Mar-2022 11:17	15-Mar-2022 14:23
Compound	CAS Number	LOR	Unit		EP2203018-006	EP2203018-007	EP2203018-008	EP2203018-009	EP2203018-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		430	420	413	447	371
Total Alkalinity as CaCO3	----	1	mg/L		430	420	413	447	371
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		494	164	206	542	1450
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		4410	742	1140	4530	10800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		221	122	144	214	404
Magnesium	7439-95-4	1	mg/L		367	105	124	412	836
Sodium	7440-23-5	1	mg/L		2500	416	648	2660	6150
Potassium	7440-09-7	1	mg/L		116	42	50	112	320
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		143	32.7	44.7	148	342
ø Total Cations	----	0.01	meq/L		153	33.9	46.8	163	365
ø Ionic Balance	----	0.01	%		3.26	1.74	2.36	4.87	3.17
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.03	0.04	<0.02	0.04
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.02	0.06	<0.02	0.07
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.35	1.02	0.03	1.93
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.07	0.22	<0.02	0.08
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	4.08	6.79	<0.01	2.59
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.20	0.38	<0.02	0.12
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	0.20	0.50	0.02	1.26
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	0.10	0.20	<0.02	0.03

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW158_220315	0089_MW161_220315	0089_MW166_220315	0089_MW171_220315	0089_MW142_220315
				Sampling date / time	15-Mar-2022 10:29	15-Mar-2022 10:44	15-Mar-2022 11:01	15-Mar-2022 11:17	15-Mar-2022 14:23
					EP2203018-006	EP2203018-007	EP2203018-008	EP2203018-009	EP2203018-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.06**	**0.12**	<0.01	**0.18**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW158_220315	0089_MW161_220315	0089_MW166_220315	0089_MW171_220315	0089_MW142_220315
				Sampling date / time	15-Mar-2022 10:29	15-Mar-2022 10:44	15-Mar-2022 11:01	15-Mar-2022 11:17	15-Mar-2022 14:23
					EP2203018-006	EP2203018-007	EP2203018-008	EP2203018-009	EP2203018-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**5.11**	**9.43**	**0.05**	**6.30**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**4.43**	**7.81**	**0.03**	**4.52**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**5.02**	**9.15**	**0.05**	**6.15**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**102**	**103**	**103**	**105**
13C8-PFOA	----	0.02	%		**115**	**109**	**110**	**114**	**111**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW141_220315	0089_MW149_220315	0089_MW139_220315	----	----
				Sampling date / time	15-Mar-2022 14:42	15-Mar-2022 14:44	15-Mar-2022 15:15	----	----
Compound	CAS Number	LOR	Unit		EP2203018-011	EP2203018-012	EP2203018-013	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**386**	**180**	**278**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**386**	**180**	**278**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1200**	**2260**	**365**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**9690**	**16600**	**3230**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**400**	----	**220**	----	----
Magnesium	7439-95-4	1	mg/L		**717**	----	**241**	----	----
Sodium	7440-23-5	1	mg/L		**5190**	----	**1770**	----	----
Potassium	7440-09-7	1	mg/L		**268**	----	**100**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**306**	**519**	**104**	----	----
ø Total Cations	----	0.01	meq/L		**312**	**565**	**110**	----	----
ø Ionic Balance	----	0.01	%		**0.90**	**4.27**	**2.84**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.97**	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**2.15**	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**30.8**	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**2.10**	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**81.2**	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.4**	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**1.58**	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**19.0**	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.81**	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW141_220315	0089_MW149_220315	0089_MW139_220315	----	----
				Sampling date / time	15-Mar-2022 14:42	15-Mar-2022 14:44	15-Mar-2022 15:15	----	----
Compound	CAS Number	LOR	Unit		EP2203018-011	EP2203018-012	EP2203018-013	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**3.17**	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.03**	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.07**	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW141_220315	0089_MW149_220315	0089_MW139_220315	----	----
				Sampling date / time	15-Mar-2022 14:42	15-Mar-2022 14:44	15-Mar-2022 15:15	----	----
Compound	CAS Number	LOR	Unit		EP2203018-011	EP2203018-012	EP2203018-013	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**142**	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**112**	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**138**	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**78.4**	**103**	**108**	----	----
13C8-PFOA	----	0.02	%		**107**	**108**	**114**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203018**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35072	Issue Date	: 23-Mar-2022
Sampler	: [redacted]		
Site	: DEF19009/Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 13		
No. of samples analysed	: 13		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4233406)									
EP2202980-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	114	115	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	114	115	0.0	0% - 20%
EP2203018-006	0089_MW158_220315	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	430	431	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	430	431	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4234057)									
EP2203018-001	0089_MW195S_220315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	309	306	0.7	0% - 20%
EP2203018-012	0089_MW149_220315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2260	2320	2.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4234056)									
EP2203018-001	0089_MW195S_220315	ED045G: Chloride	16887-00-6	1	mg/L	1040	1040	0.3	0% - 20%
EP2203018-012	0089_MW149_220315	ED045G: Chloride	16887-00-6	1	mg/L	16600	16000	3.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4232913)									
EP2203018-001	0089_MW195S_220315	ED093F: Calcium	7440-70-2	1	mg/L	198	200	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	147	148	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	556	564	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	47	48	0.0	0% - 20%
EP2203018-012	0089_MW149_220315	ED093F: Calcium	7440-70-2	1	mg/L	416	424	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1290	1310	1.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9760	9920	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	538	544	1.3	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4236652)									
EP2203018-008	0089_MW166_220315	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.02	1.03	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	6.79	6.65	2.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.04	0.05	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.22	0.24	8.9	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4236652)									
EP2203018-008	0089_MW166_220315	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.12	0.13	9.7	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.38	0.40	4.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.50	0.52	3.5	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.20	0.21	0.0	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.1	0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4236652)									
EP2203018-008	0089_MW166_220315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4236652)									
EP2203018-008	0089_MW166_220315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4236652) - continued									
EP2203018-008	0089_MW166_220315	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4236652)									
EP2203018-008	0089_MW166_220315	EP231X: Sum of PFAS	----	0.01	µg/L	9.43	9.39	0.4	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4233406)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	81.2	126
				<1	200 mg/L	100	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234057)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	87.7	113
				<1	500 mg/L	97.8	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4234056)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	111	87.9	114
				<1	1000 mg/L	104	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4232913)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	93.8	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	94.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.8	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4236652)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	85.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	80.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	96.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	90.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	97.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4236652)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	123	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	110	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4236652) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4236652)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	105	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	126	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.1	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4236652)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	97.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	96.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	97.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	72.4	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234057)							
EP2203018-001	0089_MW195S_220315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	97.1	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4234056)							
EP2203018-001	0089_MW195S_220315	ED045G: Chloride	16887-00-6	1000 mg/L	90.2	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4236652)							
EP2203018-011	0089_MW141_220315	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	89.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	# Not Determined	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4236652) - continued							
EP2203018-011	0089_MW141_220315	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	# Not Determined	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	112	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4236652)							
EP2203018-011	0089_MW141_220315	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	78.5	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	81.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	# Not Determined	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	96.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	90.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4236652)							
EP2203018-011	0089_MW141_220315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	91.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	101	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	85.7	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	101	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	78.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4236652)							
EP2203018-011	0089_MW141_220315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	93.4	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	88.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	92.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	73.0	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203018**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Site	: DEF19009/Stirling GW - MB	Issue Date	: 23-Mar-2022
Sampler	: [redacted]	No. of samples received	: 13
Order number	: DEF19009/730	No. of samples analysed	: 13

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2203018--011	0089_MW141_220315	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2203018--011	0089_MW141_220315	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2203018--011	0089_MW141_220315	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2203018--011	0089_MW141_220315	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2203018--011	0089_MW141_220315	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2203018--011	0089_MW141_220315	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2203018--011	0089_MW141_220315	**Perfluorooctanoic acid (PFOA)**	335-67-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	13	7.69	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
Container / *Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW195S_220315, 0089_MW195D_220315, 0089_MW173_220315, 0089_MW193_220315, 0089_MW158_220315, 0089_MW161_220315, 0089_MW166_220315, 0089_MW171_220315, 0089_MW142_220315, 0089_MW141_220315, 0089_MW149_220315, 0089_MW139_220315	**15-Mar-2022**	**----**	----	----	**17-Mar-2022**	29-Mar-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW195S_220315, 0089_MW195D_220315, 0089_MW173_220315, 0089_MW193_220315, 0089_MW158_220315, 0089_MW161_220315, 0089_MW166_220315, 0089_MW171_220315, 0089_MW142_220315, 0089_MW141_220315, 0089_MW149_220315, 0089_MW139_220315	**15-Mar-2022**	**----**	----	----	**23-Mar-2022**	12-Apr-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW195S_220315, 0089_MW195D_220315, 0089_MW173_220315, 0089_MW193_220315, 0089_MW158_220315, 0089_MW161_220315, 0089_MW166_220315, 0089_MW171_220315, 0089_MW142_220315, 0089_MW141_220315, 0089_MW149_220315, 0089_MW139_220315	**15-Mar-2022**	**----**	----	----	**23-Mar-2022**	12-Apr-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW195S_220315, 0089_MW195D_220315, 0089_MW173_220315, 0089_MW193_220315, 0089_MW158_220315, 0089_MW161_220315, 0089_MW166_220315, 0089_MW171_220315, 0089_MW142_220315, 0089_MW141_220315, 0089_MW139_220315	**15-Mar-2022**	**----**	----	----	**18-Mar-2022**	22-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW195S_220315, 0089_QC111_220315, 0089_MW195D_220315, 0089_MW173_220315, 0089_MW193_220315, 0089_MW158_220315, 0089_MW161_220315, 0089_MW166_220315, 0089_MW171_220315, 0089_MW142_220315, 0089_MW141_220315, 0089_MW149_220315, 0089_MW139_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW195S_220315, 0089_QC111_220315, 0089_MW195D_220315, 0089_MW173_220315, 0089_MW193_220315, 0089_MW158_220315, 0089_MW161_220315, 0089_MW166_220315, 0089_MW171_220315, 0089_MW142_220315, 0089_MW141_220315, 0089_MW149_220315, 0089_MW139_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW195S_220315, 0089_QC111_220315, 0089_MW195D_220315, 0089_MW173_220315, 0089_MW193_220315, 0089_MW158_220315, 0089_MW161_220315, 0089_MW166_220315, 0089_MW171_220315, 0089_MW142_220315, 0089_MW141_220315, 0089_MW149_220315, 0089_MW139_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW195S_220315, 0089_QC111_220315, 0089_MW195D_220315, 0089_MW173_220315, 0089_MW193_220315, 0089_MW158_220315, 0089_MW161_220315, 0089_MW166_220315, 0089_MW171_220315, 0089_MW142_220315, 0089_MW141_220315, 0089_MW149_220315, 0089_MW139_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW195S_220315, 0089_QC111_220315, 0089_MW195D_220315, 0089_MW173_220315, 0089_MW193_220315, 0089_MW158_220315, 0089_MW161_220315, 0089_MW166_220315, 0089_MW171_220315, 0089_MW142_220315, 0089_MW141_220315, 0089_MW149_220315, 0089_MW139_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	**7.69**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 35114 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW356		15/03/2022 01:11 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
002	0089_PW331		15/03/2022 01:29 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
003	0089_QC114		15/03/2022 01:30 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
004	0089_SW150		15/03/2022 01:42 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
005	0089_QC117		15/03/2022 01:44 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
006	0089_SW152		15/03/2022 01:53 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
007	0089_PW357		15/03/2022 02:09 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
008	0089_QC118		15/03/2022 02:09 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
009	0089_SW156		15/03/2022 02:54 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		

CHAIN OF CUSTODY

COC#: 35114 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW358		15/03/2022 02:55 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
011	0089_SW154		15/03/2022 02:56 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
012	0089_PW330		15/03/2022 02:57 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
013	0089_PW329		15/03/2022 02:58 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
014	0089_QC116		15/03/2022 02:59 PM	Water	ALS: 3 Non ALS: 0	No	X			use green bottle for lab QC
015	0089_QC113		15/03/2022 03:00 PM	Water	ALS: 3 Non ALS: 0	No	X			
016	0089_QC301		15/03/2022 03:06 PM	Water	ALS: 2 Non ALS: 0	No	X			
017	0089_QC302		15/03/2022 03:06 PM	Water	ALS: 2 Non ALS: 0	No	X			
018	0089_QC401		15/03/2022 03:07 PM	Water	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

(ALS) COC#: 35114 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_QC402		15/03/2022 03:07 PM	Water	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 35114 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW356	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW331	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_QC114	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW150	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_QC117	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW152	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW357	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_QC118	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_SW156	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 35114 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_PW358	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_SW154	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_PW330	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_PW329	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 35114 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW356	Clear Plastic Bottle - Natural	250 mL	00070621079905	Green	No	
001	0089_PW356	HDPE (no PTFE)	20 mL	00350621043710	Grey	No	
001	0089_PW356	HDPE (no PTFE)	20 mL	00350621043737	Grey	No	
002	0089_PW331	Clear Plastic Bottle - Natural	250 mL	00070621080027	Green	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00350621046624	Grey	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00350621046487	Grey	No	
003	0089_QC114	Clear Plastic Bottle - Natural	250 mL	00070621079913	Green	No	
003	0089_QC114	HDPE (no PTFE)	20 mL	00350621043751	Grey	No	
003	0089_QC114	HDPE (no PTFE)	20 mL	00350621043718	Grey	No	
004	0089_SW150	HDPE (no PTFE)	20 mL	00350621046283	Grey	No	
004	0089_SW150	HDPE (no PTFE)	20 mL	00350621046292	Grey	No	
004	0089_SW150	Clear Plastic Bottle - Natural	250 mL	00070621079350	Green	No	
005	0089_QC117	HDPE (no PTFE)	20 mL	00350821044788	Grey	No	
005	0089_QC117	HDPE (no PTFE)	20 mL	00350821044787	Grey	No	
005	0089_QC117	Clear Plastic Bottle - Natural	250 mL	00070621079812	Green	No	
006	0089_SW152	Clear Plastic Bottle - Natural	250 mL	00070621079211	Green	No	
006	0089_SW152	HDPE (no PTFE)	20 mL	00350821044839	Grey	No	
006	0089_SW152	HDPE (no PTFE)	20 mL	00350821044911	Grey	No	
007	0089_PW357	Clear Plastic Bottle - Natural	250 mL	00070621079790	Green	No	
007	0089_PW357	HDPE (no PTFE)	20 mL	00350821044866	Grey	No	
007	0089_PW357	HDPE (no PTFE)	20 mL	00350821044830	Grey	No	
008	0089_QC118	HDPE (no PTFE)	20 mL	00350821044834	Grey	No	
008	0089_QC118	HDPE (no PTFE)	20 mL	00350821044890	Grey	No	
008	0089_QC118	Clear Plastic Bottle - Natural	250 mL	00070621079298	Green	No	
009	0089_SW156	HDPE (no PTFE)	20 mL	00350821044840	Grey	No	
009	0089_SW156	HDPE (no PTFE)	20 mL	00350621043759	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 35114 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_SW156	Clear Plastic Bottle - Natural	250 mL	00070621079263	Green	No	
010	0089_PW358	Clear Plastic Bottle - Natural	250 mL	00070621079315	Green	No	
010	0089_PW358	HDPE (no PTFE)	20 mL	00350621043775	Grey	No	
010	0089_PW358	HDPE (no PTFE)	20 mL	00350821044858	Grey	No	
011	0089_SW154	Clear Plastic Bottle - Natural	250 mL	00070621079238	Green	No	
011	0089_SW154	HDPE (no PTFE)	20 mL	00350621043736	Grey	No	
011	0089_SW154	HDPE (no PTFE)	20 mL	00350621043711	Grey	No	
012	0089_PW330	HDPE (no PTFE)	20 mL	00350821044941	Grey	No	
012	0089_PW330	Clear Plastic Bottle - Natural	250 mL	00070621079277	Green	No	
012	0089_PW330	HDPE (no PTFE)	20 mL	00350821044893	Grey	No	
013	0089_PW329	HDPE (no PTFE)	20 mL	00350821044797	Grey	No	
013	0089_PW329	Clear Plastic Bottle - Natural	250 mL	00070621079274	Green	No	
013	0089_PW329	HDPE (no PTFE)	20 mL	00350621043780	Grey	No	
014	0089_QC116	Clear Plastic Bottle - Natural	250 mL	00070621079249	Green	No	
014	0089_QC116	HDPE (no PTFE)	20 mL	00350621043721	Grey	No	
014	0089_QC116	HDPE (no PTFE)	20 mL	00350621043747	Grey	No	
015	0089_QC113	Clear Plastic Bottle - Natural	250 mL	00070621079219	Green	No	
015	0089_QC113	HDPE (no PTFE)	20 mL	00350821044886	Grey	No	
015	0089_QC113	HDPE (no PTFE)	20 mL	00350821044847	Grey	No	
016	0089_QC301	HDPE (no PTFE)	20 mL	00350621046274	Grey	No	
016	0089_QC301	HDPE (no PTFE)	20 mL	00350621046719	Grey	No	
017	0089_QC302	HDPE (no PTFE)	20 mL	00350621046689	Grey	No	
017	0089_QC302	HDPE (no PTFE)	20 mL	00350621046266	Grey	No	
018	0089_QC401	HDPE (no PTFE)	20 mL	00350621046467	Grey	No	
018	0089_QC401	HDPE (no PTFE)	20 mL	00350621046804	Grey	No	
019	0089_QC402	HDPE (no PTFE)	20 mL	00350621046380	Grey	No	
019	0089_QC402	HDPE (no PTFE)	20 mL	00350621046513	Grey	No	

CHAIN OF CUSTODY

COC#: 35114 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

Total Bottle Count: ALS: 53, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203019**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 35114	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2022 16:20	Issue Date	: 16-Mar-2022
Client Requested Due Date	: 25-Mar-2022	Scheduled Reporting Date	: **25-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 19 / 19

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2203019-001	15-Mar-2022 13:11	0089_PW356_220315	✓	✓	✓	✓
EP2203019-002	15-Mar-2022 13:29	0089_PW331_220315	✓	✓	✓	✓
EP2203019-003	15-Mar-2022 13:30	0089_QC114_220315	✓	✓	✓	✓
EP2203019-004	15-Mar-2022 13:42	0089_SW150_220315	✓	✓	✓	✓
EP2203019-005	15-Mar-2022 13:44	0089_QC117_220315	✓	✓	✓	✓
EP2203019-006	15-Mar-2022 13:53	0089_SW152_220315	✓	✓	✓	✓
EP2203019-007	15-Mar-2022 14:09	0089_PW357_220315	✓	✓	✓	✓
EP2203019-008	15-Mar-2022 14:09	0089_QC118_220315	✓	✓	✓	✓
EP2203019-009	15-Mar-2022 14:54	0089_SW156_220315	✓	✓	✓	✓
EP2203019-010	15-Mar-2022 14:55	0089_PW358_220315	✓	✓	✓	✓
EP2203019-011	15-Mar-2022 14:56	0089_SW154_220315	✓	✓	✓	✓
EP2203019-012	15-Mar-2022 14:57	0089_PW330_220315	✓	✓	✓	✓
EP2203019-013	15-Mar-2022 14:58	0089_PW329_220315	✓	✓	✓	✓
EP2203019-014	15-Mar-2022 14:59	0089_QC116_220315		✓		
EP2203019-015	15-Mar-2022 15:00	0089_QC113_220315		✓		
EP2203019-016	15-Mar-2022 15:06	0089_QC301_220315		✓		
EP2203019-017	15-Mar-2022 15:06	0089_QC302_220315		✓		
EP2203019-018	15-Mar-2022 15:07	0089_QC401_220315		✓		
EP2203019-019	15-Mar-2022 15:07	0089_QC402_220315		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203019**	Page	: 1 of 17
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022 16:20
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35114	Issue Date	: 22-Mar-2022 13:45
Sampler	: [redacted]		
Site	: DEF19009/Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 19		
No. of samples analysed	: 19		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220315	0089_QC302_220315	0089_QC401_220315	0089_QC402_220315	----
				Sampling date / time	15-Mar-2022 15:06	15-Mar-2022 15:06	15-Mar-2022 15:07	15-Mar-2022 15:07	----
Compound	CAS Number	LOR	Unit		EP2203019-016	EP2203019-017	EP2203019-018	EP2203019-019	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220315	0089_QC302_220315	0089_QC401_220315	0089_QC402_220315	----
				Sampling date / time	15-Mar-2022 15:06	15-Mar-2022 15:06	15-Mar-2022 15:07	15-Mar-2022 15:07	----
Compound	CAS Number	LOR	Unit		EP2203019-016	EP2203019-017	EP2203019-018	EP2203019-019	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.0**	**107**	**103**	**103**	----
13C8-PFOA	----	0.02	%		**104**	**112**	**114**	**112**	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_220315	0089_SW150_220315	0089_QC117_220315	0089_SW152_220315	0089_SW156_220315
				Sampling date / time	15-Mar-2022 13:11	15-Mar-2022 13:42	15-Mar-2022 13:44	15-Mar-2022 13:53	15-Mar-2022 14:54
Compound	CAS Number	LOR	Unit		EP2203019-001	EP2203019-004	EP2203019-005	EP2203019-006	EP2203019-009
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		225	123	120	121	121
Total Alkalinity as CaCO3	----	1	mg/L		225	123	120	121	121
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2820	2600	2600	2600	2590
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19900	18800	18900	19000	18700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		519	439	481	465	459
Magnesium	7439-95-4	1	mg/L		1600	1420	1560	1520	1500
Sodium	7440-23-5	1	mg/L		12300	10800	12000	11600	11400
Potassium	7440-09-7	1	mg/L		677	584	650	631	619
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		624	587	590	592	584
ø Total Cations	----	0.01	meq/L		710	623	691	669	658
ø Ionic Balance	----	0.01	%		6.40	3.02	7.91	6.06	5.98
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_220315	0089_SW150_220315	0089_QC117_220315	0089_SW152_220315	0089_SW156_220315
				Sampling date / time	15-Mar-2022 13:11	15-Mar-2022 13:42	15-Mar-2022 13:44	15-Mar-2022 13:53	15-Mar-2022 14:54
Compound	CAS Number	LOR	Unit		EP2203019-001	EP2203019-004	EP2203019-005	EP2203019-006	EP2203019-009
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_220315	0089_SW150_220315	0089_QC117_220315	0089_SW152_220315	0089_SW156_220315
				Sampling date / time	15-Mar-2022 13:11	15-Mar-2022 13:42	15-Mar-2022 13:44	15-Mar-2022 13:53	15-Mar-2022 14:54
Compound	CAS Number	LOR	Unit		EP2203019-001	EP2203019-004	EP2203019-005	EP2203019-006	EP2203019-009
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.9**	**101**	**95.4**	**106**	**97.7**
13C8-PFOA	----	0.02	%		**105**	**102**	**108**	**103**	**104**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_220315	0089_QC113_220315	----	----	----
				Sampling date / time	15-Mar-2022 14:56	15-Mar-2022 15:00	----	----	----
Compound	CAS Number	LOR	Unit		EP2203019-011	EP2203019-015	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		119	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		119	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2580	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19400	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		461	----	----	----	----
Magnesium	7439-95-4	1	mg/L		1500	----	----	----	----
Sodium	7440-23-5	1	mg/L		11500	----	----	----	----
Potassium	7440-09-7	1	mg/L		622	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		603	----	----	----	----
ø Total Cations	----	0.01	meq/L		662	----	----	----	----
ø Ionic Balance	----	0.01	%		4.68	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_220315	0089_QC113_220315	----	----	----
				Sampling date / time	15-Mar-2022 14:56	15-Mar-2022 15:00	----	----	----
Compound	CAS Number	LOR	Unit		EP2203019-011	EP2203019-015	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_220315	0089_QC113_220315	----	----	----
				Sampling date / time	15-Mar-2022 14:56	15-Mar-2022 15:00	----	----	----
Compound	CAS Number	LOR	Unit		EP2203019-011	EP2203019-015	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.4**	**92.2**	----	----	----
13C8-PFOA	----	0.02	%		**102**	**109**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW331_220315	0089_QC114_220315	0089_PW357_220315	0089_QC118_220315	0089_PW358_220315
				Sampling date / time	15-Mar-2022 13:29	15-Mar-2022 13:30	15-Mar-2022 14:09	15-Mar-2022 14:09	15-Mar-2022 14:55
Compound	CAS Number	LOR	Unit		EP2203019-002	EP2203019-003	EP2203019-007	EP2203019-008	EP2203019-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		172	172	142	134	190
Total Alkalinity as CaCO3	----	1	mg/L		172	172	142	134	190
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2750	2750	2560	2640	2650
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19800	18800	19900	19700	19600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		491	494	470	487	494
Magnesium	7439-95-4	1	mg/L		1560	1580	1520	1570	1570
Sodium	7440-23-5	1	mg/L		11900	12200	11600	12000	12000
Potassium	7440-09-7	1	mg/L		648	656	630	651	650
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		619	591	617	613	612
ø Total Cations	----	0.01	meq/L		687	702	669	692	692
ø Ionic Balance	----	0.01	%		5.19	8.59	4.02	6.03	6.18
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.01	0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW331_220315	0089_QC114_220315	0089_PW357_220315	0089_QC118_220315	0089_PW358_220315
				Sampling date / time	15-Mar-2022 13:29	15-Mar-2022 13:30	15-Mar-2022 14:09	15-Mar-2022 14:09	15-Mar-2022 14:55
Compound	CAS Number	LOR	Unit		EP2203019-002	EP2203019-003	EP2203019-007	EP2203019-008	EP2203019-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW331_220315	0089_QC114_220315	0089_PW357_220315	0089_QC118_220315	0089_PW358_220315
				Sampling date / time	15-Mar-2022 13:29	15-Mar-2022 13:30	15-Mar-2022 14:09	15-Mar-2022 14:09	15-Mar-2022 14:55
					EP2203019-002	EP2203019-003	EP2203019-007	EP2203019-008	EP2203019-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.01**	**0.01**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.01**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**0.01**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.3**	**97.1**	**98.0**	**94.0**	**102**
13C8-PFOA	----	0.02	%		**108**	**103**	**108**	**104**	**106**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW330_220315	0089_PW329_220315	0089_QC116_220315	----	----
				Sampling date / time	15-Mar-2022 14:57	15-Mar-2022 14:58	15-Mar-2022 14:59	----	----
Compound	CAS Number	LOR	Unit		EP2203019-012	EP2203019-013	EP2203019-014	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		131	151	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		131	151	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2730	2720	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19800	19300	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		512	494	----	----	----
Magnesium	7439-95-4	1	mg/L		1650	1570	----	----	----
Sodium	7440-23-5	1	mg/L		12700	12000	----	----	----
Potassium	7440-09-7	1	mg/L		686	652	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		618	604	----	----	----
ø Total Cations	----	0.01	meq/L		731	692	----	----	----
ø Ionic Balance	----	0.01	%		8.40	6.82	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW330_220315	0089_PW329_220315	0089_QC116_220315	----	----
				Sampling date / time	15-Mar-2022 14:57	15-Mar-2022 14:58	15-Mar-2022 14:59	----	----
Compound	CAS Number	LOR	Unit		EP2203019-012	EP2203019-013	EP2203019-014	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW330_220315	0089_PW329_220315	0089_QC116_220315	----	----
				Sampling date / time	15-Mar-2022 14:57	15-Mar-2022 14:58	15-Mar-2022 14:59	----	----
Compound	CAS Number	LOR	Unit		EP2203019-012	EP2203019-013	EP2203019-014	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.6**	**95.6**	**99.9**	----	----
13C8-PFOA	----	0.02	%		**107**	**105**	**99.4**	----	----

Surrogate Control Limits

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203019**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 17-Mar-2022
C-O-C number	: 35114	Issue Date	: 22-Mar-2022
Sampler	: [redacted]		
Site	: DEF19009/Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 19		
No. of samples analysed	: 19		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4233406)									
EP2202980-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	114	115	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	114	115	0.0	0% - 20%
EP2203018-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	430	431	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	430	431	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4233407)									
EP2203019-003	0089_QC114_220315	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	172	172	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	172	172	0.0	0% - 20%
EP2203021-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4234055)									
EP2203014-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	119	118	0.0	0% - 20%
EP2203019-004	0089_SW150_220315	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2600	2500	4.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4234054)									
EP2203014-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	217	218	0.6	0% - 20%
EP2203019-004	0089_SW150_220315	ED045G: Chloride	16887-00-6	1	mg/L	18800	19400	3.5	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 4232913)									
EP2203018-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	198	200	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	147	148	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	556	564	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	47	48	0.0	0% - 20%
EP2203018-012	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	416	424	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1290	1310	1.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9760	9920	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	538	544	1.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4232914)									
EP2203019-009	0089_SW156_220315	ED093F: Calcium	7440-70-2	1	mg/L	459	450	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1500	1450	3.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11400	11100	2.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	619	599	3.3	0% - 20%
EP2203034-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	672	643	4.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1650	1580	4.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12100	11600	4.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	629	602	4.3	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4236651)									
EP2203019-014	0089_QC116_220315	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4236651)									
EP2203019-014	0089_QC116_220315	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4236651)									
EP2203019-014	0089_QC116_220315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4236651) - continued									
EP2203019-014	0089_QC116_220315	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4236651)									
EP2203019-014	0089_QC116_220315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4236651)									
EP2203019-014	0089_QC116_220315	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4233406)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	81.2	126
				<1	200 mg/L	100	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4233407)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	111	81.2	126
				<1	200 mg/L	98.9	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234055)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	87.7	113
				<1	500 mg/L	93.8	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4234054)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	87.9	114
				<1	1000 mg/L	101	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4232913)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	93.8	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	94.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.8	89.7	108
ED093F: Dissolved Major Cations (QCLot: 4232914)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	93.8	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	94.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.0	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4236651)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	94.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	91.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	98.4	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4236651) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	93.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	91.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4236651)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	113	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	115	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4236651)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	94.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4236651)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	95.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	90.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	91.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4234055)							
EP2203014-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	112	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4234054)							
EP2203014-006	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	106	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4236651)							
EP2203019-014	0089_QC116_220315	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	104	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	94.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	96.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	93.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	92.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	92.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4236651)							
EP2203019-014	0089_QC116_220315	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	99.7	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	109	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	121	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	106	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	112	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	110	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	96.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	106	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	116	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	97.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	120	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4236651)							
EP2203019-014	0089_QC116_220315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	90.3	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	86.2	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	116	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	123	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	98.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	84.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4236651)							
EP2203019-014	0089_QC116_220315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	111	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	95.0	64.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4236651) - continued							
EP2203019-014	0089_QC116_220315	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	94.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	87.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203019**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Site	: DEF19009/Stirling SW/PW - MB	Issue Date	: 22-Mar-2022
Sampler	: [redacted]	No. of samples received	: 19
Order number	: DEF19009/730	No. of samples analysed	: 19

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW356_220315, 0089_PW331_220315, 0089_QC114_220315, 0089_SW150_220315, 0089_QC117_220315, 0089_SW152_220315, 0089_PW357_220315, 0089_QC118_220315, 0089_SW156_220315, 0089_PW358_220315, 0089_SW154_220315, 0089_PW330_220315, 0089_PW329_220315	**15-Mar-2022**	**----**	----	----	**17-Mar-2022**	29-Mar-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW356_220315, 0089_PW331_220315, 0089_QC114_220315, 0089_SW150_220315, 0089_QC117_220315, 0089_SW152_220315, 0089_PW357_220315, 0089_QC118_220315, 0089_SW156_220315, 0089_PW358_220315, 0089_SW154_220315, 0089_PW330_220315, 0089_PW329_220315	**15-Mar-2022**	**----**	----	----	**22-Mar-2022**	12-Apr-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW356_220315, 0089_PW331_220315, 0089_QC114_220315, 0089_SW150_220315, 0089_QC117_220315, 0089_SW152_220315, 0089_PW357_220315, 0089_QC118_220315, 0089_SW156_220315, 0089_PW358_220315, 0089_SW154_220315, 0089_PW330_220315, 0089_PW329_220315	**15-Mar-2022**	**----**	----	----	**22-Mar-2022**	12-Apr-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW356_220315, 0089_PW331_220315, 0089_QC114_220315, 0089_SW150_220315, 0089_QC117_220315, 0089_SW152_220315, 0089_PW357_220315, 0089_QC118_220315, 0089_SW156_220315, 0089_PW358_220315, 0089_SW154_220315, 0089_PW330_220315, 0089_PW329_220315	**15-Mar-2022**	**----**	----	----	**18-Mar-2022**	22-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW356_220315, 0089_PW331_220315, 0089_QC114_220315, 0089_SW150_220315, 0089_QC117_220315, 0089_SW152_220315, 0089_PW357_220315, 0089_QC118_220315, 0089_SW156_220315, 0089_PW358_220315, 0089_SW154_220315, 0089_PW330_220315, 0089_PW329_220315, 0089_QC116_220315, 0089_QC113_220315, 0089_QC301_220315, 0089_QC302_220315, 0089_QC401_220315, 0089_QC402_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW356_220315, 0089_PW331_220315, 0089_QC114_220315, 0089_SW150_220315, 0089_QC117_220315, 0089_SW152_220315, 0089_PW357_220315, 0089_QC118_220315, 0089_SW156_220315, 0089_PW358_220315, 0089_SW154_220315, 0089_PW330_220315, 0089_PW329_220315, 0089_QC116_220315, 0089_QC113_220315, 0089_QC301_220315, 0089_QC302_220315, 0089_QC401_220315, 0089_QC402_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW356_220315, 0089_PW331_220315, 0089_QC114_220315, 0089_SW150_220315, 0089_QC117_220315, 0089_SW152_220315, 0089_PW357_220315, 0089_QC118_220315, 0089_SW156_220315, 0089_PW358_220315, 0089_SW154_220315, 0089_PW330_220315, 0089_PW329_220315, 0089_QC116_220315, 0089_QC113_220315, 0089_QC301_220315, 0089_QC302_220315, 0089_QC401_220315, 0089_QC402_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW356_220315, 0089_PW331_220315, 0089_QC114_220315, 0089_SW150_220315, 0089_QC117_220315, 0089_SW152_220315, 0089_PW357_220315, 0089_QC118_220315, 0089_SW156_220315, 0089_PW358_220315, 0089_SW154_220315, 0089_PW330_220315, 0089_PW329_220315, 0089_QC116_220315, 0089_QC113_220315, 0089_QC301_220315, 0089_QC302_220315, 0089_QC401_220315, 0089_QC402_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW356_220315, 0089_PW331_220315, 0089_QC114_220315, 0089_SW150_220315, 0089_QC117_220315, 0089_SW152_220315, 0089_PW357_220315, 0089_QC118_220315, 0089_SW156_220315, 0089_PW358_220315, 0089_SW154_220315, 0089_PW330_220315, 0089_PW329_220315, 0089_QC116_220315, 0089_QC113_220315, 0089_QC301_220315, 0089_QC302_220315, 0089_QC401_220315, 0089_QC402_220315	**15-Mar-2022**	**18-Mar-2022**	11-Sep-2022	✓	**21-Mar-2022**	11-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 35115 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD356		15/03/2022 01:13 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_QC112		15/03/2022 01:13 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD331		15/03/2022 01:23 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD357		15/03/2022 02:02 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
005	0089_SD329		15/03/2022 02:48 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
006	0089_SD358		15/03/2022 02:49 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
007	0089_SD330		15/03/2022 02:51 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
008	0089_QC115		15/03/2022 02:51 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

COC#: 35115 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD356	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_QC112	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD331	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD357	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0089_SD329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0089_SD358	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
007	0089_SD330	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
008	0089_QC115	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 35115 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED MB

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD356	HDPE Soil Jar	200 mL	00621019074627	Grey	No	
002	0089_QC112	HDPE Soil Jar	200 mL	00621019074582	Grey	No	
003	0089_SD331	HDPE Soil Jar	200 mL	00621019099248	Grey	No	
004	0089_SD357	HDPE Soil Jar	200 mL	00621019074598	Grey	No	
005	0089_SD329	HDPE Soil Jar	200 mL	00621019099143	Grey	No	
006	0089_SD358	HDPE Soil Jar	200 mL	00621019099262	Grey	No	
007	0089_SD330	HDPE Soil Jar	200 mL	00621019099191	Grey	No	
008	0089_QC115	HDPE Soil Jar	200 mL	00621019099159	Grey	No	

Total Bottle Count: ALS: 8, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203020**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19)
C-O-C number	: 35115	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Mar-2022 16:20	Issue Date	: 17-Mar-2022
Client Requested Due Date	: 25-Mar-2022	Scheduled Reporting Date	: **25-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2203020-001	15-Mar-2022 13:13	0089_SD356_220315	✓	✓
EP2203020-002	15-Mar-2022 13:13	0089_QC112_220315	✓	✓
EP2203020-003	15-Mar-2022 13:23	0089_SD331_220315	✓	✓
EP2203020-004	15-Mar-2022 14:02	0089_SD357_220315	✓	✓
EP2203020-005	15-Mar-2022 14:48	0089_SD329_220315	✓	✓
EP2203020-006	15-Mar-2022 14:49	0089_SD358_220315	✓	✓
EP2203020-007	15-Mar-2022 14:51	0089_SD330_220315	✓	✓
EP2203020-008	15-Mar-2022 14:51	0089_QC115_220315	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203020**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022 16:20
Order number	: DEF19009/730	Date Analysis Commenced	: 23-Mar-2022
C-O-C number	: 35115	Issue Date	: 28-Mar-2022 10:11
Sampler	: [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD356_220315	0089_QC112_220315	0089_SD331_220315	0089_SD357_220315	0089_SD329_220315
				Sampling date / time	15-Mar-2022 13:13	15-Mar-2022 13:13	15-Mar-2022 13:23	15-Mar-2022 14:02	15-Mar-2022 14:48
					EP2203020-001	EP2203020-002	EP2203020-003	EP2203020-004	EP2203020-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**21.1**	**20.8**	**27.8**	**24.0**	**20.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_220315	0089_QC112_220315	0089_SD331_220315	0089_SD357_220315	0089_SD329_220315
				Sampling date / time	15-Mar-2022 13:13	15-Mar-2022 13:13	15-Mar-2022 13:23	15-Mar-2022 14:02	15-Mar-2022 14:48
Compound	CAS Number	LOR	Unit		EP2203020-001	EP2203020-002	EP2203020-003	EP2203020-004	EP2203020-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**105**	**109**	**100**	**106**	**101**
13C8-PFOA	----	0.0002	%		**76.5**	**87.5**	**93.0**	**92.0**	**88.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD358_220315	0089_SD330_220315	0089_QC115_220315	----	----
			Sampling date / time	15-Mar-2022 14:49	15-Mar-2022 14:51	15-Mar-2022 14:51	----	----
Compound	CAS Number	LOR	Unit	EP2203020-006	EP2203020-007	EP2203020-008	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**26.5**	**28.2**	**22.6**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD358_220315	0089_SD330_220315	0089_QC115_220315	----	----
				Sampling date / time	15-Mar-2022 14:49	15-Mar-2022 14:51	15-Mar-2022 14:51	----	----
Compound	CAS Number	LOR	Unit		EP2203020-006	EP2203020-007	EP2203020-008	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.5**	**90.0**	**110**	----	----
13C8-PFOA	----	0.0002	%		**87.0**	**79.0**	**88.0**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203020**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 23-Mar-2022
C-O-C number	: 35115	Issue Date	: 28-Mar-2022
Sampler	: [redacted]		
Site	: DEF19009/Stirling		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4244067)									
EP2202978-003	Anonymous	EA055: Moisture Content	----	0.1	%	26.6	24.5	8.3	0% - 20%
EP2203020-003	0089_SD331_220315	EA055: Moisture Content	----	0.1	%	27.8	27.4	1.3	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4243655)									
EP2203020-001	0089_SD356_220315	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2209343-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4243655)									
EP2203020-001	0089_SD356_220315	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4243655) - continued									
EP2203020-001	0089_SD356_220315	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2209343-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4243655)									
EP2203020-001	0089_SD356_220315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2209343-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4243655)									
EP2203020-001	0089_SD356_220315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2209343-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243655)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243655)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.0	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	121	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	126	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	127	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243655)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	77.9	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.3	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243655)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	103	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	88.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	104	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243655) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	113	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243655)							
EP2203020-001	0089_SD356_220315	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	126	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	107	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	125	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	93.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	90.4	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	120	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243655)							
EP2203020-001	0089_SD356_220315	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	99.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	115	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	115	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	126	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	112	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	119	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	125	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	130	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	110	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	96.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	117	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243655)							
EP2203020-001	0089_SD356_220315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	108	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	118	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	107	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	82.4	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	112	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	109	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243655) - continued							
EP2203020-001	0089_SD356_220315	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	98.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243655)							
EP2203020-001	0089_SD356_220315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	105	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	115	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	121	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	116	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203020**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 15-Mar-2022
Site	: DEF19009/Stirling	Issue Date	: 28-Mar-2022
Sampler	: [redacted]	No. of samples received	: 8
Order number	: DEF19009/730	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD356_220315,	0089_QC112_220315,	**15-Mar-2022**	**----**	----	----	**23-Mar-2022**	29-Mar-2022	✓
0089_SD331_220315,	0089_SD357_220315,							
0089_SD329_220315,	0089_SD358_220315,							
0089_SD330_220315,	0089_QC115_220315							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD356_220315,	0089_QC112_220315,	**15-Mar-2022**	**23-Mar-2022**	11-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓
0089_SD331_220315,	0089_SD357_220315,							
0089_SD329_220315,	0089_SD358_220315,							
0089_SD330_220315,	0089_QC115_220315							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD356_220315,	0089_QC112_220315,	**15-Mar-2022**	**23-Mar-2022**	11-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓
0089_SD331_220315,	0089_SD357_220315,							
0089_SD329_220315,	0089_SD358_220315,							
0089_SD330_220315,	0089_QC115_220315							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD356_220315,	0089_QC112_220315,	**15-Mar-2022**	**23-Mar-2022**	11-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓
0089_SD331_220315,	0089_SD357_220315,							
0089_SD329_220315,	0089_SD358_220315,							
0089_SD330_220315,	0089_QC115_220315							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD356_220315,	0089_QC112_220315,	**15-Mar-2022**	**23-Mar-2022**	11-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓
0089_SD331_220315,	0089_SD357_220315,							
0089_SD329_220315,	0089_SD358_220315,							
0089_SD330_220315,	0089_QC115_220315							

Matrix: **SOIL**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD356_220315,	0089_QC112_220315,	**15-Mar-2022**	**23-Mar-2022**	11-Sep-2022	✓	**23-Mar-2022**	02-May-2022	✓
0089_SD331_220315,	0089_SD357_220315,							
0089_SD329_220315,	0089_SD358_220315,							
0089_SD330_220315,	0089_QC115_220315							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ▯ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 35139 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW216		16/03/2022 08:56 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW214		16/03/2022 09:13 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_MW215		16/03/2022 09:11 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW225		16/03/2022 10:36 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW226		16/03/2022 11:38 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab qaqc
006	0089_MW227		16/03/2022 12:31 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_MW228		16/03/2022 12:32 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_QC301		16/03/2022 02:02 PM	Water	ALS: 2 Non ALS: 0	No		X		
009	0089_QC401		16/03/2022 02:04 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: **35139** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC302		16/03/2022 02:05 PM	Water	ALS: 2 Non ALS: 0	No		X		
011	0089_QC402		16/03/2022 02:06 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

(ALS) COC#: 35139 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW216	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW214	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW215	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW225	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW226	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW227	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW228	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 35139 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW216	Clear Plastic Bottle - Natural	250 mL	00070621079988	Green	No	
001	0089_MW216	HDPE (no PTFE)	20 mL	00350621043716	Grey	No	
001	0089_MW216	HDPE (no PTFE)	20 mL	00350621043752	Grey	No	
002	0089_MW214	Clear Plastic Bottle - Natural	250 mL	00070621079342	Green	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00350821044901	Grey	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00350821044876	Grey	No	
003	0089_MW215	Clear Plastic Bottle - Natural	250 mL	00070621079937	Green	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350821044850	Grey	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350621043744	Grey	No	
004	0089_MW225	Clear Plastic Bottle - Natural	250 mL	00070621079212	Green	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350821044851	Grey	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350821044935	Grey	No	
005	0089_MW226	Clear Plastic Bottle - Natural	250 mL	00070621079345	Green	No	
005	0089_MW226	HDPE (no PTFE)	20 mL	00350621046726	Grey	No	
005	0089_MW226	HDPE (no PTFE)	20 mL	00350821044899	Grey	No	
005	0089_MW226	HDPE (no PTFE)	20 mL	00350821044900	Grey	No	
005	0089_MW226	HDPE (no PTFE)	20 mL	00350621046820	Grey	No	
006	0089_MW227	Clear Plastic Bottle - Natural	250 mL	00070621061600	Green	No	
006	0089_MW227	HDPE (no PTFE)	20 mL	00350821044943	Grey	No	
006	0089_MW227	HDPE (no PTFE)	20 mL	00350821044790	Grey	No	
007	0089_MW228	HDPE (no PTFE)	20 mL	00350821044755	Grey	No	
007	0089_MW228	HDPE (no PTFE)	20 mL	00350821044882	Grey	No	
007	0089_MW228	Clear Plastic Bottle - Natural	250 mL	00070621079299	Green	No	
008	0089_QC301	HDPE (no PTFE)	20 mL	00352101071782	Grey	No	
008	0089_QC301	HDPE (no PTFE)	20 mL	00352010008576	Grey	No	
009	0089_QC401	HDPE (no PTFE)	20 mL	00352101071794	Grey	No	

CHAIN OF CUSTODY

COC#: **35139** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_QC401	HDPE (no PTFE)	20 mL	00352010008638	Grey	No	
010	0089_QC302	HDPE (no PTFE)	20 mL	00352010008629	Grey	No	
010	0089_QC302	HDPE (no PTFE)	20 mL	00352101071096	Grey	No	
011	0089_QC402	HDPE (no PTFE)	20 mL	00352101071366	Grey	No	
011	0089_QC402	HDPE (no PTFE)	20 mL	00352101071368	Grey	No	

Total Bottle Count: ALS: 31, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203057**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19 B)
C-O-C number	: 35139	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 17-Mar-2022 11:45	Issue Date	: 21-Mar-2022
Client Requested Due Date	: 29-Mar-2022	Scheduled Reporting Date	: **29-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 9.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2203057-001	16-Mar-2022 08:56	0089_MW216_220316	✓	✓	✓	✓
EP2203057-002	16-Mar-2022 09:13	0089_MW214_220316	✓	✓	✓	✓
EP2203057-003	16-Mar-2022 09:11	0089_MW215_220316	✓	✓	✓	✓
EP2203057-004	16-Mar-2022 10:36	0089_MW225_220316	✓	✓	✓	✓
EP2203057-005	16-Mar-2022 11:38	0089_MW226_220316	✓	✓	✓	✓
EP2203057-006	16-Mar-2022 12:31	0089_MW227_220316	✓	✓	✓	✓
EP2203057-007	16-Mar-2022 12:32	0089_MW228_220316	✓	✓	✓	✓
EP2203057-008	16-Mar-2022 14:02	0089_QC301_220316		✓		
EP2203057-009	16-Mar-2022 14:04	0089_QC401_220316		✓		
EP2203057-010	16-Mar-2022 14:05	0089_QC302_220316		✓		
EP2203057-011	16-Mar-2022 14:06	0089_QC402_220316		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203057**	Page	: 1 of 11
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 17-Mar-2022 11:45
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35139	Issue Date	: 25-Mar-2022 16:27
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW216_220316	0089_MW214_220316	0089_MW215_220316	0089_MW225_220316	0089_MW226_220316
				Sampling date / time	16-Mar-2022 08:56	16-Mar-2022 09:13	16-Mar-2022 09:11	16-Mar-2022 10:36	16-Mar-2022 11:38
Compound	CAS Number	LOR	Unit		EP2203057-001	EP2203057-002	EP2203057-003	EP2203057-004	EP2203057-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**356**	**352**	**310**	**342**	**612**
Total Alkalinity as CaCO3	----	1	mg/L		**356**	**352**	**310**	**342**	**612**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**87**	**120**	**125**	**54**	**2180**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**423**	**2750**	**685**	**588**	**16000**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**144**	**288**	**192**	**149**	**416**
Magnesium	7439-95-4	1	mg/L		**44**	**175**	**56**	**53**	**1160**
Sodium	7440-23-5	1	mg/L		**176**	**1220**	**291**	**262**	**8500**
Potassium	7440-09-7	1	mg/L		**7**	**10**	**16**	**10**	**550**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**20.8**	**87.1**	**28.1**	**24.5**	**509**
ø Total Cations	----	0.01	meq/L		**18.6**	**82.1**	**27.2**	**23.4**	**500**
ø Ionic Balance	----	0.01	%		**5.61**	**2.96**	**1.56**	**2.28**	**0.88**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.53**	<0.02	**0.16**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.69**	<0.02	**0.12**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**3.65**	<0.01	**0.61**	<0.01	**0.02**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.15**	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.86**	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.9**	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**3.66**	<0.02	**0.10**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**3.16**	<0.02	**0.42**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.45**	<0.02	**0.03**	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW216_220316	0089_MW214_220316	0089_MW215_220316	0089_MW225_220316	0089_MW226_220316
				Sampling date / time	16-Mar-2022 08:56	16-Mar-2022 09:13	16-Mar-2022 09:11	16-Mar-2022 10:36	16-Mar-2022 11:38
Compound	CAS Number	LOR	Unit		EP2203057-001	EP2203057-002	EP2203057-003	EP2203057-004	EP2203057-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.41**	<0.01	**0.01**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**2.91**	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW216_220316	0089_MW214_220316	0089_MW215_220316	0089_MW225_220316	0089_MW226_220316
				Sampling date / time	16-Mar-2022 08:56	16-Mar-2022 09:13	16-Mar-2022 09:11	16-Mar-2022 10:36	16-Mar-2022 11:38
					EP2203057-001	EP2203057-002	EP2203057-003	EP2203057-004	EP2203057-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**17.4**	<0.01	**1.45**	<0.01	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**4.51**	<0.01	**0.61**	<0.01	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**16.5**	<0.01	**1.33**	<0.01	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**94.1**	**102**	**103**	**97.2**
13C8-PFOA	----	0.02	%		**104**	**100**	**104**	**110**	**96.5**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW227_220316	0089_MW228_220316	----	----	----
				Sampling date / time	16-Mar-2022 12:31	16-Mar-2022 12:32	----	----	----
Compound	CAS Number	LOR	Unit		EP2203057-006	EP2203057-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**550**	**706**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**550**	**706**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**407**	**666**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1540**	**4570**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**227**	**142**	----	----	----
Magnesium	7439-95-4	1	mg/L		**143**	**334**	----	----	----
Sodium	7440-23-5	1	mg/L		**873**	**2500**	----	----	----
Potassium	7440-09-7	1	mg/L		**46**	**131**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**62.9**	**157**	----	----	----
ø Total Cations	----	0.01	meq/L		**62.2**	**147**	----	----	----
ø Ionic Balance	----	0.01	%		**0.52**	**3.36**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.21**	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.10**	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.15**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**2.1**	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**8.23**	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**10.8**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**2.38**	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW227_220316	0089_MW228_220316	----	----	----
				Sampling date / time	16-Mar-2022 12:31	16-Mar-2022 12:32	----	----	----
Compound	CAS Number	LOR	Unit		EP2203057-006	EP2203057-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.05**	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**0.23**	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW227_220316	0089_MW228_220316	----	----	----
				Sampling date / time	16-Mar-2022 12:31	16-Mar-2022 12:32	----	----	----
Compound	CAS Number	LOR	Unit		EP2203057-006	EP2203057-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**24.2**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.15**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**24.2**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.1**	**98.2**	----	----	----
13C8-PFOA	----	0.02	%		**102**	**103**	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220316	0089_QC401_220316	0089_QC302_220316	0089_QC402_220316	----
				Sampling date / time	16-Mar-2022 14:02	16-Mar-2022 14:04	16-Mar-2022 14:05	16-Mar-2022 14:06	----
Compound	CAS Number	LOR	Unit		EP2203057-008	EP2203057-009	EP2203057-010	EP2203057-011	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220316	0089_QC401_220316	0089_QC302_220316	0089_QC402_220316	----
				Sampling date / time	16-Mar-2022 14:02	16-Mar-2022 14:04	16-Mar-2022 14:05	16-Mar-2022 14:06	----
Compound	CAS Number	LOR	Unit		EP2203057-008	EP2203057-009	EP2203057-010	EP2203057-011	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**105**	**97.8**	**103**	----
13C8-PFOA	----	0.02	%		**99.1**	**104**	**102**	**103**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203057**	Page	: 1 of 11
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 17-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35139	Issue Date	: 25-Mar-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4247621)									
EP2203057-002	0089_MW214_220316	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	352	359	2.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	352	359	2.1	0% - 20%
EP2203138-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	258	259	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	258	259	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4240154)									
EP2203057-001	0089_MW216_220316	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	87	87	0.0	0% - 20%
EP2203271-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3060	3080	0.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4240153)									
EP2203057-001	0089_MW216_220316	ED045G: Chloride	16887-00-6	1	mg/L	423	420	0.7	0% - 20%
EP2203271-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	8740	8770	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4241830)									
EP2203057-001	0089_MW216_220316	ED093F: Calcium	7440-70-2	1	mg/L	144	152	5.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	44	46	3.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	176	181	2.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	7	8	0.0	No Limit
EP2203058-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	447	448	0.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1480	1490	0.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11300	11200	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	619	622	0.5	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4242852)									
ES2209558-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2209558-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.07	0.06	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.13	0.12	0.0	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4243469)									
EP2203057-005	0089_MW226_220316	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4242852)									
ES2209558-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
ES2209558-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	0.07	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4242852) - continued									
ES2209558-003	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4243469)									
EP2203057-005	0089_MW226_220316	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4242852)									
ES2209558-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2209558-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4243469)									
EP2203057-005	0089_MW226_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4242852)									
ES2209558-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2209558-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4243469)									
EP2203057-005	0089_MW226_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4242852)									
ES2209558-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.06	0.06	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4242852) - continued									
ES2209558-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.28	0.29	3.5	0% - 20%
EP231P: PFAS Sums (QC Lot: 4243469)									
EP2203057-005	0089_MW226_220316	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4247621)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	98.6	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240154)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.3	87.7	113
				<1	500 mg/L	93.0	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4240153)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.2	87.9	114
				<1	1000 mg/L	102	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4241830)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	93.8	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.1	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4242852)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	96.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	91.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	97.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	95.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	85.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243469)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	100	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	96.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4242852)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	96.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4242852) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	111	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	107	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	128	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243469)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	104	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4242852)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	83.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	103	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	98.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243469)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.8	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	107	66.0	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243469) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	125	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	98.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4242852)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	90.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	83.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243469)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	87.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	123	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.0	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240154)							
EP2203057-001	0089_MW216_220316	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	116	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4240153)							
EP2203057-001	0089_MW216_220316	ED045G: Chloride	16887-00-6	1000 mg/L	98.0	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4242852)							
ES2209558-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	104	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	94.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	90.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	98.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	94.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	93.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243469)							
EP2203138-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	107	72.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243469) - continued							
EP2203138-004	Anonymous	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	86.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	70.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	83.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	96.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4242852)							
ES2209558-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	89.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	126	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	105	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	110	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	101	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	115	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	116	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243469)							
EP2203138-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	99.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	116	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	97.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	91.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	101	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	115	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	91.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4242852)							
ES2209558-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	87.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	87.5	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	86.2	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	91.4	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	99.2	57.6	145

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4242852) - continued							
ES2209558-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	89.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	83.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243469)							
EP2203138-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	108	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	108	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	90.4	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	112	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	119	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	89.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4242852)							
ES2209558-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	102	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	106	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	89.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	74.0	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243469)							
EP2203138-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	108	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	94.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	82.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203057**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 17-Mar-2022
Site	: DEF19009/Stirling GW - AG	Issue Date	: 25-Mar-2022
Sampler	: [redacted]	No. of samples received	: 11
Order number	: DEF19009/730	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	33	9.09	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW216_220316, 0089_MW214_220316, 0089_MW215_220316, 0089_MW225_220316, 0089_MW226_220316, 0089_MW227_220316, 0089_MW228_220316	**16-Mar-2022**	**----**	----	----	**24-Mar-2022**	30-Mar-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW216_220316, 0089_MW214_220316, 0089_MW215_220316, 0089_MW225_220316, 0089_MW226_220316, 0089_MW227_220316, 0089_MW228_220316	**16-Mar-2022**	**----**	----	----	**24-Mar-2022**	13-Apr-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW216_220316, 0089_MW214_220316, 0089_MW215_220316, 0089_MW225_220316, 0089_MW226_220316, 0089_MW227_220316, 0089_MW228_220316	**16-Mar-2022**	**----**	----	----	**24-Mar-2022**	13-Apr-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW216_220316, 0089_MW214_220316, 0089_MW215_220316, 0089_MW225_220316, 0089_MW226_220316, 0089_MW227_220316, 0089_MW228_220316	**16-Mar-2022**	**----**	----	----	**23-Mar-2022**	23-Mar-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW216_220316, 0089_MW214_220316, 0089_MW215_220316, 0089_MW225_220316	**16-Mar-2022**	**23-Mar-2022**	12-Sep-2022	✓	**23-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X) 0089_MW226_220316, 0089_MW227_220316, 0089_MW228_220316, 0089_QC301_220316, 0089_QC401_220316, 0089_QC302_220316, 0089_QC402_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0089_MW216_220316, 0089_MW214_220316, 0089_MW215_220316, 0089_MW225_220316	**16-Mar-2022**	**23-Mar-2022**	12-Sep-2022	✓	**23-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X) 0089_MW226_220316, 0089_MW227_220316, 0089_MW228_220316, 0089_QC301_220316, 0089_QC401_220316, 0089_QC302_220316, 0089_QC402_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_MW216_220316, 0089_MW214_220316, 0089_MW215_220316, 0089_MW225_220316	**16-Mar-2022**	**23-Mar-2022**	12-Sep-2022	✓	**23-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X) 0089_MW226_220316, 0089_MW227_220316, 0089_MW228_220316, 0089_QC301_220316, 0089_QC401_220316, 0089_QC302_220316, 0089_QC402_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW216_220316, 0089_MW214_220316, 0089_MW215_220316, 0089_MW225_220316	**16-Mar-2022**	**23-Mar-2022**	12-Sep-2022	✓	**23-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X) 0089_MW226_220316, 0089_MW227_220316, 0089_MW228_220316, 0089_QC301_220316, 0089_QC401_220316, 0089_QC302_220316, 0089_QC402_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW216_220316, 0089_MW214_220316, 0089_MW215_220316, 0089_MW225_220316	**16-Mar-2022**	**23-Mar-2022**	12-Sep-2022	✓	**23-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_MW226_220316, 0089_MW227_220316, 0089_MW228_220316, 0089_QC301_220316, 0089_QC401_220316, 0089_QC302_220316, 0089_QC402_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	33	**9.09**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 35147 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW307		16/03/2022 09:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_SW309		16/03/2022 09:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW314		16/03/2022 09:22 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_PW308		16/03/2022 09:23 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_SW311		16/03/2022 09:23 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW316		16/03/2022 09:24 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW306		16/03/2022 09:25 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_SW310		16/03/2022 09:25 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_PW315		16/03/2022 09:26 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

(ALS) COC#: 35147 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW411		16/03/2022 10:48 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc
011	0089_SW412		16/03/2022 10:49 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_PW413		16/03/2022 10:51 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
013	0089_SW414		16/03/2022 10:52 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_PW415		16/03/2022 10:53 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
015	0089_SW416		16/03/2022 10:54 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
016	0089_PW409		16/03/2022 11:41 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
017	0089_SW410		16/03/2022 11:43 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
018	0089_SW408		16/03/2022 12:28 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc

CHAIN OF CUSTODY

(ALS) COC#: 35147 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_PW407		16/03/2022 12:29 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
020	0089_SW406		16/03/2022 12:30 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
021	0089_PW405		16/03/2022 12:31 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
022	0089_PW378		16/03/2022 01:07 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
023	0089_SW319		16/03/2022 01:10 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
024	0089_SW317		16/03/2022 01:11 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
025	0089_PW375		16/03/2022 01:12 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
026	0089_PW374		16/03/2022 01:13 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
027	0089_SW318		16/03/2022 01:14 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc

CHAIN OF CUSTODY

ALS COC#: 35147 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19
SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW307	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW309	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW314	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW308	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW311	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW316	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW306	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_SW310	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW315	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 35147 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_PW411	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_SW412	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_PW413	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_SW414	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_PW415	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_SW416	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
016	0089_PW409	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
017	0089_SW410	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
018	0089_SW408	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
019	0089_PW407	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 35147 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

020	0089_SW406	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
021	0089_PW405	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
022	0089_PW378	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
023	0089_SW319	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
024	0089_SW317	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
025	0089_PW375	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
026	0089_PW374	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
027	0089_SW318	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 35147 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]
PRIMARY SAMPLER

CONTACT PH:
QUOTE NO: SY/139/19
SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW307	Clear Plastic Bottle - Natural	250 mL	0070621080024	Green	No	
001	0089_PW307	HDPE (no PTFE)	20 mL	0035062104368 4	Grey	No	
001	0089_PW307	HDPE (no PTFE)	20 mL	0035062104373 2	Grey	No	
002	0089_SW309	HDPE (no PTFE)	20 mL	0035062104370 0	Grey	No	
002	0089_SW309	HDPE (no PTFE)	20 mL	0035062104372 0	Grey	No	
002	0089_SW309	Clear Plastic Bottle - Natural	250 mL	0070621079927	Green	No	
003	0089_PW314	HDPE (no PTFE)	20 mL	0035082104479 3	Grey	No	
003	0089_PW314	Clear Plastic Bottle - Natural	250 mL	0070621079674	Green	No	
003	0089_PW314	HDPE (no PTFE)	20 mL	0035062104370 3	Grey	No	
004	0089_PW308	Clear Plastic Bottle - Natural	250 mL	0070621079929	Green	No	
004	0089_PW308	HDPE (no PTFE)	20 mL	0035062104370 5	Grey	No	
004	0089_PW308	HDPE (no PTFE)	20 mL	0035062104370 4	Grey	No	
005	0089_SW311	Clear Plastic Bottle - Natural	250 mL	0070621079938	Green	No	
005	0089_SW311	HDPE (no PTFE)	20 mL	0035062104377 6	Grey	No	
005	0089_SW311	HDPE (no PTFE)	20 mL	0035082104486 2	Grey	No	
006	0089_PW316	Clear Plastic Bottle - Natural	250 mL	0070621079656	Green	No	
006	0089_PW316	HDPE (no PTFE)	20 mL	0035062104376 8	Grey	No	
006	0089_PW316	HDPE (no PTFE)	20 mL	0035062104369 2	Grey	No	
007	0089_PW306	Clear Plastic Bottle - Natural	250 mL	0070621079842	Green	No	
007	0089_PW306	HDPE (no PTFE)	20 mL	0035062104377 2	Grey	No	
007	0089_PW306	HDPE (no PTFE)	20 mL	0035062104376 2	Grey	No	
008	0089_SW310	Clear Plastic Bottle - Natural	250 mL	0070621080033	Green	No	
008	0089_SW310	HDPE (no PTFE)	20 mL	0035082104484 1	Grey	No	
008	0089_SW310	HDPE (no PTFE)	20 mL	0035082104492 1	Grey	No	
009	0089_PW315	Clear Plastic Bottle - Natural	250 mL	0070621080016	Green	No	
009	0089_PW315	HDPE (no PTFE)	20 mL	0035062104376 5	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 35147 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW315	HDPE (no PTFE)	20 mL	00350621043758	Grey	No	
010	0089_PW411	Clear Plastic Bottle - Natural	250 mL	00070621079264	Green	No	
010	0089_PW411	HDPE (no PTFE)	20 mL	00350821044919	Grey	No	
010	0089_PW411	HDPE (no PTFE)	20 mL	00350821044768	Grey	No	
010	0089_PW411	HDPE (no PTFE)	20 mL	00352010008517	Grey	No	
010	0089_PW411	HDPE (no PTFE)	20 mL	00352101071297	Grey	No	
011	0089_SW412	Clear Plastic Bottle - Natural	250 mL	00070621079205	Green	No	
011	0089_SW412	HDPE (no PTFE)	20 mL	00350821044751	Grey	No	
011	0089_SW412	HDPE (no PTFE)	20 mL	00350821044884	Grey	No	
012	0089_PW413	Clear Plastic Bottle - Natural	250 mL	00070621079225	Green	No	
012	0089_PW413	HDPE (no PTFE)	20 mL	00350821044771	Grey	No	
012	0089_PW413	HDPE (no PTFE)	20 mL	00350621043694	Grey	No	
013	0089_SW414	Clear Plastic Bottle - Natural	250 mL	00070621079235	Green	No	
013	0089_SW414	HDPE (no PTFE)	20 mL	00350621043740	Grey	No	
013	0089_SW414	HDPE (no PTFE)	20 mL	00350821044829	Grey	No	
014	0089_PW415	HDPE (no PTFE)	20 mL	00350621043697	Grey	No	
014	0089_PW415	HDPE (no PTFE)	20 mL	00350621043738	Grey	No	
014	0089_PW415	Clear Plastic Bottle - Natural	250 mL	00070621079690	Green	No	
015	0089_SW416	Clear Plastic Bottle - Natural	250 mL	00070621079914	Green	No	
015	0089_SW416	HDPE (no PTFE)	20 mL	00350621043773	Grey	No	
015	0089_SW416	HDPE (no PTFE)	20 mL	00350621043770	Grey	No	
016	0089_PW409	HDPE (no PTFE)	20 mL	00350821044838	Grey	No	
016	0089_PW409	HDPE (no PTFE)	20 mL	00350621043689	Grey	No	
016	0089_PW409	Clear Plastic Bottle - Natural	250 mL	00070621079262	Green	No	
017	0089_SW410	Clear Plastic Bottle - Natural	250 mL	00070621079275	Green	No	
017	0089_SW410	HDPE (no PTFE)	20 mL	00350821044923	Grey	No	
017	0089_SW410	HDPE (no PTFE)	20 mL	00350821044757	Grey	No	

CHAIN OF CUSTODY

COC#: 35147 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

018	0089_SW408	HDPE (no PTFE)	20 mL	00352101071508	Grey	No	
018	0089_SW408	HDPE (no PTFE)	20 mL	00352101070941	Grey	No	
018	0089_SW408	HDPE (no PTFE)	20 mL	00350821044767	Grey	No	
018	0089_SW408	HDPE (no PTFE)	20 mL	00350621043754	Grey	No	
018	0089_SW408	Clear Plastic Bottle - Natural	250 mL	00070621079255	Green	No	
019	0089_PW407	HDPE (no PTFE)	20 mL	00350821044915	Grey	No	
019	0089_PW407	HDPE (no PTFE)	20 mL	00350821044934	Grey	No	
019	0089_PW407	Clear Plastic Bottle - Natural	250 mL	00070621079204	Green	No	
020	0089_SW406	Clear Plastic Bottle - Natural	250 mL	00070621079268	Green	No	
020	0089_SW406	HDPE (no PTFE)	20 mL	00350621043682	Grey	No	
020	0089_SW406	HDPE (no PTFE)	20 mL	00350821044804	Grey	No	
021	0089_PW405	Clear Plastic Bottle - Natural	250 mL	00070621079254	Green	No	
021	0089_PW405	HDPE (no PTFE)	20 mL	00350821044806	Grey	No	
021	0089_PW405	HDPE (no PTFE)	20 mL	00350821044805	Grey	No	
022	0089_PW378	Clear Plastic Bottle - Natural	250 mL	00070621079223	Green	No	
022	0089_PW378	HDPE (no PTFE)	20 mL	00350821044808	Grey	No	
022	0089_PW378	HDPE (no PTFE)	20 mL	00350821044922	Grey	No	
023	0089_SW319	HDPE (no PTFE)	20 mL	00350821044849	Grey	No	
023	0089_SW319	Clear Plastic Bottle - Natural	250 mL	00070621061597	Green	No	
023	0089_SW319	HDPE (no PTFE)	20 mL	00350621043769	Grey	No	
024	0089_SW317	Clear Plastic Bottle - Natural	250 mL	00070621079209	Green	No	
024	0089_SW317	HDPE (no PTFE)	20 mL	00350821044845	Grey	No	
024	0089_SW317	HDPE (no PTFE)	20 mL	00350821044794	Grey	No	
025	0089_PW375	Clear Plastic Bottle - Natural	250 mL	00070621079208	Green	No	
025	0089_PW375	HDPE (no PTFE)	20 mL	00350821044761	Grey	No	
025	0089_PW375	HDPE (no PTFE)	20 mL	00350821044823	Grey	No	
026	0089_PW374	Clear Plastic Bottle - Natural	250 mL	00070621079259	Green	No	

CHAIN OF CUSTODY

COC#: 35147 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

026	0089_PW374	HDPE (no PTFE)	20 mL	00350621043729	Grey	No	
026	0089_PW374	HDPE (no PTFE)	20 mL	00350821044782	Grey	No	
027	0089_SW318	HDPE (no PTFE)	20 mL	00352101038042	Grey	No	
027	0089_SW318	HDPE (no PTFE)	20 mL	00352101071699	Grey	No	
027	0089_SW318	Clear Plastic Bottle - Natural	250 mL	00070621079261	Green	No	
027	0089_SW318	HDPE (no PTFE)	20 mL	00350821044916	Grey	No	
027	0089_SW318	HDPE (no PTFE)	20 mL	00350821044752	Grey	No	

Total Bottle Count: ALS: 87, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203058**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19 B)
C-O-C number	: 35147	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 17-Mar-2022 11:45	Issue Date	: 21-Mar-2022
Client Requested Due Date	: 29-Mar-2022	Scheduled Reporting Date	: **29-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 9.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 27 / 27

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2203058-001	16-Mar-2022 09:21	0089_PW307_220316	✓	✓	✓	✓
EP2203058-002	16-Mar-2022 09:21	0089_SW309_220316	✓	✓	✓	✓
EP2203058-003	16-Mar-2022 09:22	0089_PW314_220316	✓	✓	✓	✓
EP2203058-004	16-Mar-2022 09:23	0089_PW308_220316	✓	✓	✓	✓
EP2203058-005	16-Mar-2022 09:23	0089_SW311_220316	✓	✓	✓	✓
EP2203058-006	16-Mar-2022 09:24	0089_PW316_220316	✓	✓	✓	✓
EP2203058-007	16-Mar-2022 09:25	0089_PW306_220316	✓	✓	✓	✓
EP2203058-008	16-Mar-2022 09:25	0089_SW310_220316	✓	✓	✓	✓
EP2203058-009	16-Mar-2022 09:26	0089_PW315_220316	✓	✓	✓	✓
EP2203058-010	16-Mar-2022 10:48	0089_PW411_220316	✓	✓	✓	✓
EP2203058-011	16-Mar-2022 10:49	0089_SW412_220316	✓	✓	✓	✓
EP2203058-012	16-Mar-2022 10:51	0089_PW413_220316	✓	✓	✓	✓
EP2203058-013	16-Mar-2022 10:52	0089_SW414_220316	✓	✓	✓	✓
EP2203058-014	16-Mar-2022 10:53	0089_PW415_220316	✓	✓	✓	✓
EP2203058-015	16-Mar-2022 10:54	0089_SW416_220316	✓	✓	✓	✓
EP2203058-016	16-Mar-2022 11:41	0089_PW409_220316	✓	✓	✓	✓
EP2203058-017	16-Mar-2022 11:43	0089_SW410_220316	✓	✓	✓	✓
EP2203058-018	16-Mar-2022 12:28	0089_SW408_220316	✓	✓	✓	✓
EP2203058-019	16-Mar-2022 12:29	0089_PW407_220316	✓	✓	✓	✓
EP2203058-020	16-Mar-2022 12:30	0089_SW406_220316	✓	✓	✓	✓
EP2203058-021	16-Mar-2022 12:31	0089_PW405_220316	✓	✓	✓	✓
EP2203058-022	16-Mar-2022 13:07	0089_PW378_220316	✓	✓	✓	✓
EP2203058-023	16-Mar-2022 13:10	0089_SW319_220316	✓	✓	✓	✓
EP2203058-024	16-Mar-2022 13:11	0089_SW317_220316	✓	✓	✓	✓
EP2203058-025	16-Mar-2022 13:12	0089_PW375_220316	✓	✓	✓	✓
EP2203058-026	16-Mar-2022 13:13	0089_PW374_220316	✓	✓	✓	✓
EP2203058-027	16-Mar-2022 13:14	0089_SW318_220316	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]

DERP LAB REPORTS

- EDI Format - ESDAT (ESDAT)	Email	[redacted]

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203058**	Page	: 1 of 21
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 17-Mar-2022 11:45
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35147	Issue Date	: 29-Mar-2022 10:48
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 27		
No. of samples analysed	: 27		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW314_220316	0089_PW308_220316	0089_PW316_220316	0089_PW306_220316	0089_PW315_220316
				Sampling date / time	16-Mar-2022 09:22	16-Mar-2022 09:23	16-Mar-2022 09:24	16-Mar-2022 09:25	16-Mar-2022 09:26
Compound	CAS Number	LOR	Unit		EP2203058-003	EP2203058-004	EP2203058-006	EP2203058-007	EP2203058-009
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		135	136	120	116	138
Total Alkalinity as CaCO3	----	1	mg/L		135	136	120	116	138
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2710	2820	2780	2800	2890
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19300	19100	18800	19300	19100
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		489	447	430	456	479
Magnesium	7439-95-4	1	mg/L		1600	1480	1420	1520	1560
Sodium	7440-23-5	1	mg/L		12100	11300	10700	11500	11800
Potassium	7440-09-7	1	mg/L		674	619	596	644	664
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		604	600	591	605	602
ø Total Cations	----	0.01	meq/L		700	651	619	664	682
ø Ionic Balance	----	0.01	%		7.37	4.09	2.35	4.69	6.29
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW314_220316	0089_PW308_220316	0089_PW316_220316	0089_PW306_220316	0089_PW315_220316
				Sampling date / time	16-Mar-2022 09:22	16-Mar-2022 09:23	16-Mar-2022 09:24	16-Mar-2022 09:25	16-Mar-2022 09:26
Compound	CAS Number	LOR	Unit		EP2203058-003	EP2203058-004	EP2203058-006	EP2203058-007	EP2203058-009
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW314_220316	0089_PW308_220316	0089_PW316_220316	0089_PW306_220316	0089_PW315_220316
				Sampling date / time	16-Mar-2022 09:22	16-Mar-2022 09:23	16-Mar-2022 09:24	16-Mar-2022 09:25	16-Mar-2022 09:26
Compound	CAS Number	LOR	Unit		EP2203058-003	EP2203058-004	EP2203058-006	EP2203058-007	EP2203058-009
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.8**	**92.9**	**98.9**	**101**	**106**
13C8-PFOA	----	0.02	%		**98.0**	**105**	**106**	**101**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW411_220316	0089_PW413_220316	0089_PW415_220316	0089_PW409_220316	0089_PW407_220316
				Sampling date / time	16-Mar-2022 10:48	16-Mar-2022 10:51	16-Mar-2022 10:53	16-Mar-2022 11:41	16-Mar-2022 12:29
Compound	CAS Number	LOR	Unit		EP2203058-010	EP2203058-012	EP2203058-014	EP2203058-016	EP2203058-019
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		129	111	174	229	110
Total Alkalinity as CaCO3	----	1	mg/L		129	111	174	229	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2900	2960	2640	2300	2950
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19600	20100	16900	16000	19600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		486	452	390	393	458
Magnesium	7439-95-4	1	mg/L		1610	1500	1260	1180	1520
Sodium	7440-23-5	1	mg/L		12200	11400	9380	8840	11500
Potassium	7440-09-7	1	mg/L		680	628	532	488	636
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		616	631	535	504	616
ø Total Cations	----	0.01	meq/L		705	658	545	514	664
ø Ionic Balance	----	0.01	%		6.74	2.10	0.89	0.98	3.74
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW411_220316	0089_PW413_220316	0089_PW415_220316	0089_PW409_220316	0089_PW407_220316
				Sampling date / time	16-Mar-2022 10:48	16-Mar-2022 10:51	16-Mar-2022 10:53	16-Mar-2022 11:41	16-Mar-2022 12:29
Compound	CAS Number	LOR	Unit		EP2203058-010	EP2203058-012	EP2203058-014	EP2203058-016	EP2203058-019
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW411_220316	0089_PW413_220316	0089_PW415_220316	0089_PW409_220316	0089_PW407_220316
				Sampling date / time	16-Mar-2022 10:48	16-Mar-2022 10:51	16-Mar-2022 10:53	16-Mar-2022 11:41	16-Mar-2022 12:29
					EP2203058-010	EP2203058-012	EP2203058-014	EP2203058-016	EP2203058-019
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.0**	**90.9**	**103**	**99.1**	**98.5**
13C8-PFOA	----	0.02	%		**103**	**105**	**104**	**101**	**105**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW405_220316	0089_PW375_220316	0089_PW374_220316	----	----
				Sampling date / time	16-Mar-2022 12:31	16-Mar-2022 13:12	16-Mar-2022 13:13	----	----
Compound	CAS Number	LOR	Unit		EP2203058-021	EP2203058-025	EP2203058-026	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**157**	**183**	**138**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**157**	**183**	**138**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2910**	**2190**	**2700**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20800**	**16600**	**20400**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**488**	**392**	**454**	----	----
Magnesium	7439-95-4	1	mg/L		**1610**	**1230**	**1480**	----	----
Sodium	7440-23-5	1	mg/L		**12200**	**9360**	**11200**	----	----
Potassium	7440-09-7	1	mg/L		**682**	**517**	**618**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**650**	**518**	**634**	----	----
ø Total Cations	----	0.01	meq/L		**705**	**541**	**647**	----	----
ø Ionic Balance	----	0.01	%		**4.02**	**2.23**	**1.01**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.01**	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.03**	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.05**	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW405_220316	0089_PW375_220316	0089_PW374_220316	----	----
				Sampling date / time	16-Mar-2022 12:31	16-Mar-2022 13:12	16-Mar-2022 13:13	----	----
Compound	CAS Number	LOR	Unit		EP2203058-021	EP2203058-025	EP2203058-026	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW405_220316	0089_PW375_220316	0089_PW374_220316	----	----
				Sampling date / time	16-Mar-2022 12:31	16-Mar-2022 13:12	16-Mar-2022 13:13	----	----
Compound	CAS Number	LOR	Unit		EP2203058-021	EP2203058-025	EP2203058-026	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.08**	**0.01**	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.01**	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.08**	**0.01**	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.9**	**90.0**	**95.8**	----	----
13C8-PFOA	----	0.02	%		**92.7**	**93.4**	**91.2**	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW307_220316	0089_SW309_220316	0089_SW311_220316	0089_SW310_220316	0089_SW412_220316
				Sampling date / time	16-Mar-2022 09:21	16-Mar-2022 09:21	16-Mar-2022 09:23	16-Mar-2022 09:25	16-Mar-2022 10:49
Compound	CAS Number	LOR	Unit		EP2203058-001	EP2203058-002	EP2203058-005	EP2203058-008	EP2203058-011
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		132	123	123	122	123
Total Alkalinity as CaCO3	----	1	mg/L		132	123	123	122	123
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2740	2680	2760	2810	2770
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18800	19100	18500	19200	19100
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		475	452	452	461	464
Magnesium	7439-95-4	1	mg/L		1540	1480	1480	1520	1530
Sodium	7440-23-5	1	mg/L		11700	11200	11200	11400	11600
Potassium	7440-09-7	1	mg/L		654	615	626	639	648
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		590	597	582	602	599
ø Total Cations	----	0.01	meq/L		676	647	648	660	670
ø Ionic Balance	----	0.01	%		6.80	4.04	5.35	4.57	5.62
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW307_220316	0089_SW309_220316	0089_SW311_220316	0089_SW310_220316	0089_SW412_220316
				Sampling date / time	16-Mar-2022 09:21	16-Mar-2022 09:21	16-Mar-2022 09:23	16-Mar-2022 09:25	16-Mar-2022 10:49
Compound	CAS Number	LOR	Unit		EP2203058-001	EP2203058-002	EP2203058-005	EP2203058-008	EP2203058-011
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW307_220316	0089_SW309_220316	0089_SW311_220316	0089_SW310_220316	0089_SW412_220316
				Sampling date / time	16-Mar-2022 09:21	16-Mar-2022 09:21	16-Mar-2022 09:23	16-Mar-2022 09:25	16-Mar-2022 10:49
Compound	CAS Number	LOR	Unit		EP2203058-001	EP2203058-002	EP2203058-005	EP2203058-008	EP2203058-011
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.0**	**107**	**95.0**	**95.4**	**95.8**
13C8-PFOA	----	0.02	%		**100**	**107**	**98.9**	**103**	**104**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW414_220316	0089_SW416_220316	0089_SW410_220316	0089_SW408_220316	0089_SW406_220316
				Sampling date / time	16-Mar-2022 10:52	16-Mar-2022 10:54	16-Mar-2022 11:43	16-Mar-2022 12:28	16-Mar-2022 12:30
Compound	CAS Number	LOR	Unit		EP2203058-013	EP2203058-015	EP2203058-017	EP2203058-018	EP2203058-020
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		126	116	125	122	123
Total Alkalinity as CaCO3	----	1	mg/L		126	116	125	122	123
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2890	2840	2950	2950	2910
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19400	19200	19000	19800	19500
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		431	473	443	466	442
Magnesium	7439-95-4	1	mg/L		1420	1560	1460	1540	1460
Sodium	7440-23-5	1	mg/L		10800	11800	11100	11700	11000
Potassium	7440-09-7	1	mg/L		592	653	606	648	608
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		610	603	600	622	613
ø Total Cations	----	0.01	meq/L		623	682	640	675	636
ø Ionic Balance	----	0.01	%		1.08	6.14	3.28	4.09	1.85
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW414_220316	0089_SW416_220316	0089_SW410_220316	0089_SW408_220316	0089_SW406_220316
				Sampling date / time	16-Mar-2022 10:52	16-Mar-2022 10:54	16-Mar-2022 11:43	16-Mar-2022 12:28	16-Mar-2022 12:30
Compound	CAS Number	LOR	Unit		EP2203058-013	EP2203058-015	EP2203058-017	EP2203058-018	EP2203058-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW414_220316	0089_SW416_220316	0089_SW410_220316	0089_SW408_220316	0089_SW406_220316
				Sampling date / time	16-Mar-2022 10:52	16-Mar-2022 10:54	16-Mar-2022 11:43	16-Mar-2022 12:28	16-Mar-2022 12:30
					EP2203058-013	EP2203058-015	EP2203058-017	EP2203058-018	EP2203058-020
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.8**	**101**	**98.1**	**102**	**92.3**
13C8-PFOA	----	0.02	%		**102**	**99.8**	**103**	**100**	**94.4**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW378_220316	0089_SW319_220316	0089_SW317_220316	0089_SW318_220316	----
				Sampling date / time	16-Mar-2022 13:07	16-Mar-2022 13:10	16-Mar-2022 13:11	16-Mar-2022 13:14	----
Compound	CAS Number	LOR	Unit		EP2203058-022	EP2203058-023	EP2203058-024	EP2203058-027	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		165	123	123	122	----
Total Alkalinity as CaCO3	----	1	mg/L		165	123	123	122	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2490	2680	2660	2620	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17800	20000	19800	20000	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		408	436	463	470	----
Magnesium	7439-95-4	1	mg/L		1320	1430	1520	1540	----
Sodium	7440-23-5	1	mg/L		9960	10900	11500	11700	----
Potassium	7440-09-7	1	mg/L		556	598	638	643	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		557	622	616	621	----
ø Total Cations	----	0.01	meq/L		576	629	665	676	----
ø Ionic Balance	----	0.01	%		1.69	0.51	3.78	4.20	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW378_220316	0089_SW319_220316	0089_SW317_220316	0089_SW318_220316	----
				Sampling date / time	16-Mar-2022 13:07	16-Mar-2022 13:10	16-Mar-2022 13:11	16-Mar-2022 13:14	----
Compound	CAS Number	LOR	Unit		EP2203058-022	EP2203058-023	EP2203058-024	EP2203058-027	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW378_220316	0089_SW319_220316	0089_SW317_220316	0089_SW318_220316	----
				Sampling date / time	16-Mar-2022 13:07	16-Mar-2022 13:10	16-Mar-2022 13:11	16-Mar-2022 13:14	----
Compound	CAS Number	LOR	Unit		EP2203058-022	EP2203058-023	EP2203058-024	EP2203058-027	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.2**	**93.0**	**86.0**	**91.1**	----
13C8-PFOA	----	0.02	%		**89.5**	**92.1**	**90.6**	**92.3**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203058**	Page	: 1 of 10
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 17-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35147	Issue Date	: 29-Mar-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 27		
No. of samples analysed	: 27		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4250195)									
EP2203058-002	0089_SW309_220316	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	121	1.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	123	121	1.7	0% - 20%
EP2203058-012	0089_PW413_220316	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	111	110	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	111	110	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4250196)									
EP2203058-022	0089_PW378_220316	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	165	167	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	165	167	1.1	0% - 20%
EP2203260-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	105	107	1.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	105	107	1.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4240156)									
EP2203058-021	0089_PW405_220316	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2910	2910	0.2	0% - 20%
EP2203305-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	40	40	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4240159)									
EP2203058-001	0089_PW307_220316	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2730	0.2	0% - 20%
EP2203058-011	0089_SW412_220316	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2770	2880	3.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 4240155)									
EP2203058-021	0089_PW405_220316	ED045G: Chloride	16887-00-6	1	mg/L	20800	21000	0.8	0% - 20%
EP2203305-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	127	127	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4240158)									
EP2203058-001	0089_PW307_220316	ED045G: Chloride	16887-00-6	1	mg/L	18800	18800	0.4	0% - 20%
EP2203058-011	0089_SW412_220316	ED045G: Chloride	16887-00-6	1	mg/L	19100	19500	2.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4241830)									
EP2203057-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	144	152	5.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	44	46	3.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	176	181	2.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	7	8	0.0	No Limit
EP2203058-004	0089_PW308_220316	ED093F: Calcium	7440-70-2	1	mg/L	447	448	0.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1480	1490	0.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11300	11200	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	619	622	0.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4241831)									
EP2203058-014	0089_PW415_220316	ED093F: Calcium	7440-70-2	1	mg/L	390	416	6.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1260	1350	6.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9380	10100	7.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	532	571	7.0	0% - 20%
EP2203058-024	0089_SW317_220316	ED093F: Calcium	7440-70-2	1	mg/L	463	440	4.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1450	4.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11000	4.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	638	603	5.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4246489)									
EP2203058-010	0089_PW411_220316	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4246939)									
EP2203058-027	0089_SW318_220316	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4246489)									
EP2203058-010	0089_PW411_220316	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4246489) - continued									
EP2203058-010	0089_PW411_220316	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4246939)									
EP2203058-027	0089_SW318_220316	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4246489)									
EP2203058-010	0089_PW411_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4246939)									
EP2203058-027	0089_SW318_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4246939) - continued									
EP2203058-027	0089_SW318_220316	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4246489)									
EP2203058-010	0089_PW411_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4246939)									
EP2203058-027	0089_SW318_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4246489)									
EP2203058-010	0089_PW411_220316	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4246939)									
EP2203058-027	0089_SW318_220316	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4250195)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	81.2	126
				<1	200 mg/L	100	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4250196)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	101	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240156)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	87.7	113
				<1	500 mg/L	98.8	87.7	113
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240159)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	87.7	113
				<1	500 mg/L	100	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4240155)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.5	87.9	114
				<1	1000 mg/L	106	87.9	114
ED045G: Chloride by Discrete Analyser (QCLot: 4240158)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	87.9	114
				<1	1000 mg/L	103	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4241830)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	93.8	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.1	89.7	108
ED093F: Dissolved Major Cations (QCLot: 4241831)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.5	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.2	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	87.3	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 4241831) - continued								
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.7	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4246489)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	77.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	80.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	87.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	79.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	70.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4246939)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	84.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	79.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	94.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	84.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	84.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	80.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4246489)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	103	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4246939)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	86.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	83.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	87.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	90.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4246939) - continued								
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	94.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4246489)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	91.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	92.6	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.1	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	75.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	70.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4246939)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	86.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	84.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	86.3	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	84.0	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.1	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	87.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	95.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4246489)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	86.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	100	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	101	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4246939)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	85.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	87.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	93.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	92.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240156)							
EP2203058-021	0089_PW405_220316	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240159)							
EP2203058-001	0089_PW307_220316	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4240155)							
EP2203058-021	0089_PW405_220316	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4240158)							
EP2203058-001	0089_PW307_220316	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4246489)							
EP2203058-018	0089_SW408_220316	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	92.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	79.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	79.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	81.2	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	78.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	78.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4246489)							
EP2203058-018	0089_SW408_220316	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	79.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	89.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	114	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	92.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	86.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	87.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	91.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	86.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	99.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4246489)							
EP2203058-018	0089_SW408_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	104	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.4	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	89.8	62.6	147

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4246489) - continued							
EP2203058-018	0089_SW408_220316	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	80.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	85.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	80.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4246489)							
EP2203058-018	0089_SW408_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	77.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	97.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	88.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	87.6	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203058**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 17-Mar-2022
Site	: DEF19009/Stirling SW/PW - AG	Issue Date	: 29-Mar-2022
Sampler	: [redacted]	No. of samples received	: 27
Order number	: DEF19009/730	No. of samples analysed	: 27

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2203058--021	0089_PW405_220316	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2203058--001	0089_PW307_220316	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2203058--021	0089_PW405_220316	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2203058--001	0089_PW307_220316	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	38	5.26	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	38	2.63	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW307_220316, 0089_SW309_220316, 0089_PW314_220316, 0089_PW308_220316, 0089_SW311_220316, 0089_PW316_220316, 0089_PW306_220316, 0089_SW310_220316, 0089_PW315_220316, 0089_PW411_220316, 0089_SW412_220316, 0089_PW413_220316, 0089_SW414_220316, 0089_PW415_220316, 0089_SW416_220316, 0089_PW409_220316, 0089_SW410_220316, 0089_SW408_220316, 0089_PW407_220316, 0089_SW406_220316, 0089_PW405_220316, 0089_PW378_220316, 0089_SW319_220316, 0089_SW317_220316, 0089_PW375_220316, 0089_PW374_220316, 0089_SW318_220316	**16-Mar-2022**	**----**	----	----	**25-Mar-2022**	30-Mar-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW405_220316, 0089_PW378_220316, 0089_SW319_220316, 0089_SW317_220316, 0089_PW375_220316, 0089_PW374_220316, 0089_SW318_220316	**16-Mar-2022**	**----**	----	----	**25-Mar-2022**	13-Apr-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_PW307_220316, 0089_SW309_220316, 0089_PW314_220316, 0089_PW308_220316, 0089_SW311_220316, 0089_PW316_220316, 0089_PW306_220316, 0089_SW310_220316, 0089_PW315_220316, 0089_PW411_220316, 0089_SW412_220316, 0089_PW413_220316, 0089_SW414_220316, 0089_PW415_220316, 0089_SW416_220316, 0089_PW409_220316, 0089_SW410_220316, 0089_SW408_220316, 0089_PW407_220316, 0089_SW406_220316	**16-Mar-2022**	**----**	----	----	**29-Mar-2022**	13-Apr-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW405_220316, 0089_PW378_220316, 0089_SW319_220316, 0089_SW317_220316, 0089_PW375_220316, 0089_PW374_220316, 0089_SW318_220316	**16-Mar-2022**	**----**	----	----	**25-Mar-2022**	13-Apr-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_PW307_220316, 0089_SW309_220316, 0089_PW314_220316, 0089_PW308_220316, 0089_SW311_220316, 0089_PW316_220316, 0089_PW306_220316, 0089_SW310_220316, 0089_PW315_220316, 0089_PW411_220316, 0089_SW412_220316, 0089_PW413_220316, 0089_SW414_220316, 0089_PW415_220316, 0089_SW416_220316, 0089_PW409_220316, 0089_SW410_220316, 0089_SW408_220316, 0089_PW407_220316, 0089_SW406_220316	**16-Mar-2022**	**----**	----	----	**29-Mar-2022**	13-Apr-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW307_220316, 0089_SW309_220316, 0089_PW314_220316, 0089_PW308_220316, 0089_SW311_220316, 0089_PW316_220316, 0089_PW306_220316, 0089_SW310_220316, 0089_PW315_220316, 0089_PW411_220316, 0089_SW412_220316, 0089_PW413_220316, 0089_SW414_220316, 0089_PW415_220316, 0089_SW416_220316, 0089_PW409_220316, 0089_SW410_220316, 0089_SW408_220316, 0089_PW407_220316, 0089_SW406_220316, 0089_PW405_220316, 0089_PW378_220316, 0089_SW319_220316, 0089_SW317_220316, 0089_PW375_220316, 0089_PW374_220316, 0089_SW318_220316	**16-Mar-2022**	**----**	----	----	**23-Mar-2022**	23-Mar-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW307_220316, 0089_SW309_220316, 0089_PW314_220316, 0089_PW308_220316, 0089_SW311_220316, 0089_PW316_220316, 0089_PW306_220316, 0089_SW310_220316, 0089_PW315_220316, 0089_PW411_220316, 0089_SW412_220316, 0089_PW413_220316, 0089_SW414_220316, 0089_PW415_220316, 0089_SW416_220316, 0089_PW409_220316, 0089_SW410_220316, 0089_SW408_220316, 0089_PW407_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_SW406_220316, 0089_PW405_220316, 0089_PW378_220316, 0089_SW319_220316, 0089_SW317_220316, 0089_PW375_220316, 0089_PW374_220316, 0089_SW318_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	12-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW307_220316, 0089_SW309_220316, 0089_PW314_220316, 0089_PW308_220316, 0089_SW311_220316, 0089_PW316_220316, 0089_PW306_220316, 0089_SW310_220316, 0089_PW315_220316, 0089_PW411_220316, 0089_SW412_220316, 0089_PW413_220316, 0089_SW414_220316, 0089_PW415_220316, 0089_SW416_220316, 0089_PW409_220316, 0089_SW410_220316, 0089_SW408_220316, 0089_PW407_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_SW406_220316, 0089_PW405_220316, 0089_PW378_220316, 0089_SW319_220316, 0089_SW317_220316, 0089_PW375_220316, 0089_PW374_220316, 0089_SW318_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	12-Sep-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW307_220316, 0089_SW309_220316, 0089_PW314_220316, 0089_PW308_220316, 0089_SW311_220316, 0089_PW316_220316, 0089_PW306_220316, 0089_SW310_220316, 0089_PW315_220316, 0089_PW411_220316, 0089_SW412_220316, 0089_PW413_220316, 0089_SW414_220316, 0089_PW415_220316, 0089_SW416_220316, 0089_PW409_220316, 0089_SW410_220316, 0089_SW408_220316, 0089_PW407_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_SW406_220316, 0089_PW405_220316, 0089_PW378_220316, 0089_SW319_220316, 0089_SW317_220316, 0089_PW375_220316, 0089_PW374_220316, 0089_SW318_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	12-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW307_220316, 0089_SW309_220316, 0089_PW314_220316, 0089_PW308_220316, 0089_SW311_220316, 0089_PW316_220316, 0089_PW306_220316, 0089_SW310_220316, 0089_PW315_220316, 0089_PW411_220316, 0089_SW412_220316, 0089_PW413_220316, 0089_SW414_220316, 0089_PW415_220316, 0089_SW416_220316, 0089_PW409_220316, 0089_SW410_220316, 0089_SW408_220316, 0089_PW407_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_SW406_220316, 0089_PW405_220316, 0089_PW378_220316, 0089_SW319_220316, 0089_SW317_220316, 0089_PW375_220316, 0089_PW374_220316, 0089_SW318_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	12-Sep-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW307_220316, 0089_SW309_220316, 0089_PW314_220316, 0089_PW308_220316, 0089_SW311_220316, 0089_PW316_220316, 0089_PW306_220316, 0089_SW310_220316, 0089_PW315_220316, 0089_PW411_220316, 0089_SW412_220316, 0089_PW413_220316, 0089_SW414_220316, 0089_PW415_220316, 0089_SW416_220316, 0089_PW409_220316, 0089_SW410_220316, 0089_SW408_220316, 0089_PW407_220316	**16-Mar-2022**	**24-Mar-2022**	12-Sep-2022	✓	**24-Mar-2022**	12-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_SW406_220316, 0089_PW405_220316, 0089_PW378_220316, 0089_SW319_220316, 0089_SW317_220316, 0089_PW375_220316, 0089_PW374_220316, 0089_SW318_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	12-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	38	**2.63**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 35150 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD306		16/03/2022 09:27 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_SD307		16/03/2022 09:28 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD308		16/03/2022 09:28 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
004	0089_SD314		16/03/2022 09:28 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
005	0089_SD315		16/03/2022 09:28 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
006	0089_SD316		16/03/2022 09:28 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
007	0089_SD411		16/03/2022 10:55 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
008	0089_SD413		16/03/2022 10:55 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
009	0089_SD415		16/03/2022 10:55 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

ALS COC#: 35150 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SD409		16/03/2022 11:40 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
011	0089_SD405		16/03/2022 12:33 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
012	0089_SD407		16/03/2022 12:34 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
013	0089_SD374		16/03/2022 01:16 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
014	0089_SD378		16/03/2022 01:17 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
015	0089_SD375		16/03/2022 01:18 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

ALS COC#: 35150 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD306	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_SD307	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD308	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0089_SD314	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0089_SD315	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0089_SD316	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
007	0089_SD411	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
008	0089_SD413	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
009	0089_SD415	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
010	0089_SD409	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
011	0089_SD405	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
012	0089_SD407	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
013	0089_SD374	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
014	0089_SD378	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
015	0089_SD375	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 35150 *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD306	HDPE Soil Jar	200 mL	00621019099172	Grey	No	
002	0089_SD307	HDPE Soil Jar	200 mL	00621019099179	Grey	No	
003	0089_SD308	HDPE Soil Jar	200 mL	00621019099174	Grey	No	
004	0089_SD314	HDPE Soil Jar	200 mL	00621019099207	Grey	No	
005	0089_SD315	HDPE Soil Jar	200 mL	00621019099233	Grey	No	
006	0089_SD316	HDPE Soil Jar	200 mL	00621019099150	Grey	No	
007	0089_SD411	HDPE Soil Jar	200 mL	00621019099182	Grey	No	
008	0089_SD413	HDPE Soil Jar	200 mL	00621019099178	Grey	No	
009	0089_SD415	HDPE Soil Jar	200 mL	00621019099149	Grey	No	
010	0089_SD409	HDPE Soil Jar	200 mL	00621019099268	Grey	No	
011	0089_SD405	HDPE Soil Jar	200 mL	00621019099235	Grey	No	
012	0089_SD407	HDPE Soil Jar	200 mL	00621019099173	Grey	No	
013	0089_SD374	HDPE Soil Jar	200 mL	00621019099155	Grey	No	
014	0089_SD378	HDPE Soil Jar	200 mL	00621019099160	Grey	No	
015	0089_SD375	HDPE Soil Jar	200 mL	00621019099181	Grey	No	

Total Bottle Count: ALS: 15, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203059**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19 B)
C-O-C number	: 35150	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 17-Mar-2022 11:45	Issue Date	: 21-Mar-2022
Client Requested Due Date	: 29-Mar-2022	Scheduled Reporting Date	: **29-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 9.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2203059-001	16-Mar-2022 09:27	0089_SD306_220316	✓	✓
EP2203059-002	16-Mar-2022 09:28	0089_SD307_220316	✓	✓
EP2203059-003	16-Mar-2022 09:28	0089_SD308_220316	✓	✓
EP2203059-004	16-Mar-2022 09:28	0089_SD314_220316	✓	✓
EP2203059-005	16-Mar-2022 09:28	0089_SD315_220316	✓	✓
EP2203059-006	16-Mar-2022 09:28	0089_SD316_220316	✓	✓
EP2203059-007	16-Mar-2022 10:55	0089_SD411_220316	✓	✓
EP2203059-008	16-Mar-2022 10:55	0089_SD413_220316	✓	✓
EP2203059-009	16-Mar-2022 10:55	0089_SD415_220316	✓	✓
EP2203059-010	16-Mar-2022 11:40	0089_SD409_220316	✓	✓
EP2203059-011	16-Mar-2022 12:33	0089_SD405_220316	✓	✓
EP2203059-012	16-Mar-2022 12:34	0089_SD407_220316	✓	✓
EP2203059-013	16-Mar-2022 13:16	0089_SD374_220316	✓	✓
EP2203059-014	16-Mar-2022 13:17	0089_SD378_220316	✓	✓
EP2203059-015	16-Mar-2022 13:18	0089_SD375_220316	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203059**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 17-Mar-2022 11:45
Order number	: DEF19009/730	Date Analysis Commenced	: 25-Mar-2022
C-O-C number	: 35150	Issue Date	: 29-Mar-2022 10:19
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD306_220316	0089_SD307_220316	0089_SD308_220316	0089_SD314_220316	0089_SD315_220316
			Sampling date / time	16-Mar-2022 09:27	16-Mar-2022 09:28	16-Mar-2022 09:28	16-Mar-2022 09:28	16-Mar-2022 09:28
Compound	CAS Number	LOR	Unit	EP2203059-001	EP2203059-002	EP2203059-003	EP2203059-004	EP2203059-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	12.6	15.2	6.0	17.0	6.6
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD306_220316	0089_SD307_220316	0089_SD308_220316	0089_SD314_220316	0089_SD315_220316
				Sampling date / time	16-Mar-2022 09:27	16-Mar-2022 09:28	16-Mar-2022 09:28	16-Mar-2022 09:28	16-Mar-2022 09:28
Compound	CAS Number	LOR	Unit		EP2203059-001	EP2203059-002	EP2203059-003	EP2203059-004	EP2203059-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**91.0**	**89.0**	**92.5**	**89.5**	**100**
13C8-PFOA	----	0.0002	%		**99.0**	**94.5**	**95.5**	**95.0**	**102**

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD316_220316	0089_SD411_220316	0089_SD413_220316	0089_SD415_220316	0089_SD409_220316
				Sampling date / time	16-Mar-2022 09:28	16-Mar-2022 10:55	16-Mar-2022 10:55	16-Mar-2022 10:55	16-Mar-2022 11:40
					EP2203059-006	EP2203059-007	EP2203059-008	EP2203059-009	EP2203059-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**8.0**	**15.7**	**24.6**	**11.4**	**21.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD316_220316	0089_SD411_220316	0089_SD413_220316	0089_SD415_220316	0089_SD409_220316
				Sampling date / time	16-Mar-2022 09:28	16-Mar-2022 10:55	16-Mar-2022 10:55	16-Mar-2022 10:55	16-Mar-2022 11:40
Compound	CAS Number	LOR	Unit		EP2203059-006	EP2203059-007	EP2203059-008	EP2203059-009	EP2203059-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**89.0**	**100**	**106**	**101**	**91.5**
13C8-PFOA	----	0.0002	%		**85.0**	**87.0**	**90.0**	**85.5**	**88.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD405_220316	0089_SD407_220316	0089_SD374_220316	0089_SD378_220316	0089_SD375_220316
			Sampling date / time	16-Mar-2022 12:33	16-Mar-2022 12:34	16-Mar-2022 13:16	16-Mar-2022 13:17	16-Mar-2022 13:18
Compound	CAS Number	LOR	Unit	EP2203059-011	EP2203059-012	EP2203059-013	EP2203059-014	EP2203059-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**13.0**	**15.8**	**13.5**	**20.5**	**22.4**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_220316	0089_SD407_220316	0089_SD374_220316	0089_SD378_220316	0089_SD375_220316
				Sampling date / time	16-Mar-2022 12:33	16-Mar-2022 12:34	16-Mar-2022 13:16	16-Mar-2022 13:17	16-Mar-2022 13:18
Compound	CAS Number	LOR	Unit		EP2203059-011	EP2203059-012	EP2203059-013	EP2203059-014	EP2203059-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**90.0**	**97.0**	**84.5**	**106**	**89.0**
13C8-PFOA	----	0.0002	%		**94.5**	**96.5**	**98.5**	**94.5**	**91.0**

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203059**	Page	: 1 of 14
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 17-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 25-Mar-2022
C-O-C number	: 35150	Issue Date	: 29-Mar-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4252300)									
EP2203059-003	0089_SD308_220316	EA055: Moisture Content	----	0.1	%	6.0	6.7	12.2	0% - 20%
EP2203059-014	0089_SD378_220316	EA055: Moisture Content	----	0.1	%	20.5	21.2	3.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4245971)									
EP2203059-001	0089_SD306_220316	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2210007-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4250818)									
EP2203059-006	0089_SD316_220316	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2203335-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4250818) - continued									
EP2203335-007	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4251496)									
EP2203059-005	0089_SD315_220316	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2203339-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4245971)									
EP2203059-001	0089_SD306_220316	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2210007-006	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4250818)									
EP2203059-006	0089_SD316_220316	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2203335-007	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4251496)									
EP2203059-005	0089_SD315_220316	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2203339-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4251496) - continued									
EP2203339-005	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4245971)									
EP2203059-001	0089_SD306_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2210007-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4250818)									
EP2203059-006	0089_SD316_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4250818) - continued									
EP2203059-006	0089_SD316_220316	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2203335-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4251496)									
EP2203059-005	0089_SD315_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2203339-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4251496) - continued									
EP2203339-005	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4245971)									
EP2203059-001	0089_SD306_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2210007-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4250818)									
EP2203059-006	0089_SD316_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2203335-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4251496)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4251496) - continued									
EP2203059-005	0089_SD315_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2203339-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4245971)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4250818)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4251496)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	71.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4245971)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	83.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	121	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4250818)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	84.8	71.0	135

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4250818) - continued								
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.2	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4251496)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	77.7	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	72.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4245971)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.5	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.7	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.1	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4250818)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	69.8	131

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4250818) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	76.0	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	118	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4251496)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.2	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	72.8	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.7	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	67.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4245971)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	82.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	89.2	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	117	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4250818)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	87.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	82.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	80.0	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	81.6	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4251496)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	91.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	68.0	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	70.8	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4245971)							
EP2203059-001	0089_SD306_220316	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	112	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	100	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	106	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	84.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	87.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	89.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4250818)							
EP2203059-006	0089_SD316_220316	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	100	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	85.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	80.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	82.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	90.4	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	95.6	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4251496)							
EP2203059-005	0089_SD315_220316	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	105	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	76.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	77.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	81.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	87.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	84.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4245971)							
EP2203059-001	0089_SD306_220316	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	81.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	113	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	112	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	94.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	103	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	106	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	99.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	110	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	108	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	93.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	113	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4250818)							
EP2203059-006	0089_SD316_220316	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	81.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	89.2	70.0	132

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4250818) - continued							
EP2203059-006	0089_SD316_220316	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	98.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	98.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	112	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	89.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	84.0	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	98.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	95.2	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4251496)							
EP2203059-005	0089_SD315_220316	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	110	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	89.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	117	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	89.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	97.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	94.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	91.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	79.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	90.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	113	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	86.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4245971)							
EP2203059-001	0089_SD306_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	105	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	91.5	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	109	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	125	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	80.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	86.8	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4250818)							
EP2203059-006	0089_SD316_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	86.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	97.9	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	104	69.8	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4250818) - continued							
EP2203059-006	0089_SD316_220316	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	72.1	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	112	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	91.6	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	85.6	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4251496)							
EP2203059-005	0089_SD315_220316	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	88.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	90.5	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	86.2	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	88.5	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	115	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	86.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	75.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4245971)							
EP2203059-001	0089_SD306_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	94.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	105	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	97.2	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	114	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4250818)							
EP2203059-006	0089_SD316_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	89.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	79.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	76.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	82.0	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4251496)							
EP2203059-005	0089_SD315_220316	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	93.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	68.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	72.0	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203059**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 17-Mar-2022
Site	: DEF19009/Stirling SED AG	Issue Date	: 29-Mar-2022
Sampler	: [redacted]	No. of samples received	: 15
Order number	: DEF19009/730	No. of samples analysed	: 15

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD306_220316, 0089_SD307_220316, 0089_SD308_220316, 0089_SD314_220316, 0089_SD315_220316, 0089_SD316_220316, 0089_SD411_220316, 0089_SD413_220316, 0089_SD415_220316, 0089_SD409_220316, 0089_SD405_220316, 0089_SD407_220316, 0089_SD374_220316, 0089_SD378_220316, 0089_SD375_220316	**16-Mar-2022**	**----**	----	----	**28-Mar-2022**	30-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD306_220316, 0089_SD307_220316, 0089_SD308_220316, 0089_SD314_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	04-May-2022	✓
HDPE Soil Jar (EP231X)							
0089_SD315_220316, 0089_SD316_220316, 0089_SD411_220316, 0089_SD413_220316, 0089_SD415_220316, 0089_SD409_220316, 0089_SD405_220316, 0089_SD407_220316, 0089_SD374_220316, 0089_SD378_220316, 0089_SD375_220316	**16-Mar-2022**	**28-Mar-2022**	12-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD306_220316, 0089_SD307_220316, 0089_SD308_220316, 0089_SD314_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	04-May-2022	✓
HDPE Soil Jar (EP231X)							
0089_SD315_220316, 0089_SD316_220316, 0089_SD411_220316, 0089_SD413_220316, 0089_SD415_220316, 0089_SD409_220316, 0089_SD405_220316, 0089_SD407_220316, 0089_SD374_220316, 0089_SD378_220316, 0089_SD375_220316	**16-Mar-2022**	**28-Mar-2022**	12-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓

Matrix: **SOIL**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) 0089_SD306_220316, 0089_SD307_220316, 0089_SD308_220316, 0089_SD314_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	04-May-2022	✓
HDPE Soil Jar (EP231X) 0089_SD315_220316, 0089_SD316_220316, 0089_SD411_220316, 0089_SD413_220316, 0089_SD415_220316, 0089_SD409_220316, 0089_SD405_220316, 0089_SD407_220316, 0089_SD374_220316, 0089_SD378_220316, 0089_SD375_220316	**16-Mar-2022**	**28-Mar-2022**	12-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) 0089_SD306_220316, 0089_SD307_220316, 0089_SD308_220316, 0089_SD314_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	04-May-2022	✓
HDPE Soil Jar (EP231X) 0089_SD315_220316, 0089_SD316_220316, 0089_SD411_220316, 0089_SD413_220316, 0089_SD415_220316, 0089_SD409_220316, 0089_SD405_220316, 0089_SD407_220316, 0089_SD374_220316, 0089_SD378_220316, 0089_SD375_220316	**16-Mar-2022**	**28-Mar-2022**	12-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) 0089_SD306_220316, 0089_SD307_220316, 0089_SD308_220316, 0089_SD314_220316	**16-Mar-2022**	**25-Mar-2022**	12-Sep-2022	✓	**25-Mar-2022**	04-May-2022	✓
HDPE Soil Jar (EP231X) 0089_SD315_220316, 0089_SD316_220316, 0089_SD411_220316, 0089_SD413_220316, 0089_SD415_220316, 0089_SD409_220316, 0089_SD405_220316, 0089_SD407_220316, 0089_SD374_220316, 0089_SD378_220316, 0089_SD375_220316	**16-Mar-2022**	**28-Mar-2022**	12-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ▯ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: **35210** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW199		17/03/2022 08:56 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW203		17/03/2022 09:10 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_MW517		17/03/2022 09:31 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW255		17/03/2022 09:53 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab qaqc
005	0089_MW256		17/03/2022 10:07 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW259		17/03/2022 10:19 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_MW257		17/03/2022 10:37 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_MW010		17/03/2022 11:17 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
009	0089_MW261		17/03/2022 11:32 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

COC#: **35210** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW233		17/03/2022 11:53 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
011	0089_MW217		17/03/2022 12:38 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
012	0089_MW282		17/03/2022 12:51 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
013	0089_MW224		17/03/2022 01:04 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
014	0089_MW268		17/03/2022 01:29 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab qaqc
015	0089_MW269		17/03/2022 01:57 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
016	0089_MW516		17/03/2022 02:19 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
017	0089_MW249		17/03/2022 02:31 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
018	0089_MW242		17/03/2022 02:50 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

COC#: **35210** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_MW289		17/03/2022 03:13 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
020	0089_QC301		17/03/2022 03:18 PM	Water	ALS: 2 Non ALS: 0	No		X		
021	0089_QC401		17/03/2022 03:19 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

(ALS) COC#: 35210 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW199	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW203	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW517	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW255	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW256	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW259	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW257	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW010	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW261	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **35210** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_MW233	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW217	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW282	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_MW224	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_MW268	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_MW269	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
016	0089_MW516	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
017	0089_MW249	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
018	0089_MW242	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
019	0089_MW289	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **35210** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW199	Clear Plastic Bottle - Natural	250 mL	00070621079295	Green	No	
001	0089_MW199	HDPE (no PTFE)	20 mL	00350821044873	Grey	No	
001	0089_MW199	HDPE (no PTFE)	20 mL	00350821044749	Grey	No	
002	0089_MW203	Clear Plastic Bottle - Natural	250 mL	00070621079221	Green	No	
002	0089_MW203	HDPE (no PTFE)	20 mL	00350821044867	Grey	No	
002	0089_MW203	HDPE (no PTFE)	20 mL	00350621043745	Grey	No	
003	0089_MW517	Clear Plastic Bottle - Natural	250 mL	00070621079253	Green	No	
003	0089_MW517	HDPE (no PTFE)	20 mL	00350821044879	Grey	No	
003	0089_MW517	HDPE (no PTFE)	20 mL	00350821044836	Grey	No	
004	0089_MW255	Clear Plastic Bottle - Natural	250 mL	00070621079340	Green	No	
004	0089_MW255	HDPE (no PTFE)	20 mL	00350621046463	Grey	No	
004	0089_MW255	HDPE (no PTFE)	20 mL	00352010008699	Grey	No	
004	0089_MW255	HDPE (no PTFE)	20 mL	00350821044864	Grey	No	
004	0089_MW255	HDPE (no PTFE)	20 mL	00350821044781	Grey	No	
005	0089_MW256	Clear Plastic Bottle - Natural	250 mL	00070621079206	Green	No	
005	0089_MW256	HDPE (no PTFE)	20 mL	00350821044798	Grey	No	
005	0089_MW256	HDPE (no PTFE)	20 mL	00350821044857	Grey	No	
006	0089_MW259	HDPE (no PTFE)	20 mL	00350821044894	Grey	No	
006	0089_MW259	HDPE (no PTFE)	20 mL	00350621043784	Grey	No	
006	0089_MW259	Clear Plastic Bottle - Natural	250 mL	00070621079289	Green	No	
007	0089_MW257	Clear Plastic Bottle - Natural	250 mL	00070621079310	Green	No	
007	0089_MW257	HDPE (no PTFE)	20 mL	00352101039023	Grey	No	
007	0089_MW257	HDPE (no PTFE)	20 mL	00350821044925	Grey	No	
008	0089_MW010	Clear Plastic Bottle - Natural	250 mL	00070621079312	Green	No	
008	0089_MW010	HDPE (no PTFE)	20 mL	00350821044789	Grey	No	
008	0089_MW010	HDPE (no PTFE)	20 mL	00350821044927	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: **35210** *ALS Laboratory:* EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW261	Clear Plastic Bottle - Natural	250 mL	00070621079307	Green	No	
009	0089_MW261	HDPE (no PTFE)	20 mL	00350821044883	Grey	No	
009	0089_MW261	HDPE (no PTFE)	20 mL	00350621043748	Grey	No	
010	0089_MW233	Clear Plastic Bottle - Natural	250 mL	00070621079260	Green	No	
010	0089_MW233	HDPE (no PTFE)	20 mL	00350821044898	Grey	No	
010	0089_MW233	HDPE (no PTFE)	20 mL	00350821044902	Grey	No	
011	0089_MW217	Clear Plastic Bottle - Natural	250 mL	00070621079338	Green	No	
011	0089_MW217	HDPE (no PTFE)	20 mL	00350621043725	Grey	No	
011	0089_MW217	HDPE (no PTFE)	20 mL	00350621043771	Grey	No	
012	0089_MW282	Clear Plastic Bottle - Natural	250 mL	00070621079216	Green	No	
012	0089_MW282	HDPE (no PTFE)	20 mL	00350821044913	Grey	No	
012	0089_MW282	HDPE (no PTFE)	20 mL	00350821044758	Grey	No	
013	0089_MW224	HDPE (no PTFE)	20 mL	00350821044872	Grey	No	
013	0089_MW224	HDPE (no PTFE)	20 mL	00350621043777	Grey	No	
013	0089_MW224	Clear Plastic Bottle - Natural	250 mL	00070621079272	Green	No	
014	0089_MW268	Clear Plastic Bottle - Natural	250 mL	00070621079316	Green	No	
014	0089_MW268	HDPE (no PTFE)	20 mL	00352010008528	Grey	No	
014	0089_MW268	HDPE (no PTFE)	20 mL	00352101071680	Grey	No	
014	0089_MW268	HDPE (no PTFE)	20 mL	00350821044914	Grey	No	
014	0089_MW268	HDPE (no PTFE)	20 mL	00350821044895	Grey	No	
015	0089_MW269	HDPE (no PTFE)	20 mL	00350821044904	Grey	No	
015	0089_MW269	HDPE (no PTFE)	20 mL	00350821044803	Grey	No	
015	0089_MW269	Clear Plastic Bottle - Natural	250 mL	00070621079346	Green	No	
016	0089_MW516	Clear Plastic Bottle - Natural	250 mL	00070621212122	Green	No	
016	0089_MW516	HDPE (no PTFE)	20 mL	00350821044802	Grey	No	
016	0089_MW516	HDPE (no PTFE)	20 mL	00350821044753	Grey	No	
017	0089_MW249	Clear Plastic Bottle - Natural	250 mL	00070621079242	Green	No	

CHAIN OF CUSTODY

(ALS) COC#: **35210** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

017	0089_MW249	HDPE (no PTFE)	20 mL	00350821044844	Grey	No	
017	0089_MW249	HDPE (no PTFE)	20 mL	00350821044885	Grey	No	
018	0089_MW242	Clear Plastic Bottle - Natural	250 mL	00070621079228	Green	No	
018	0089_MW242	HDPE (no PTFE)	20 mL	00350621043755	Grey	No	
018	0089_MW242	HDPE (no PTFE)	20 mL	00350821044835	Grey	No	
019	0089_MW289	HDPE (no PTFE)	20 mL	00350821044759	Grey	No	
019	0089_MW289	HDPE (no PTFE)	20 mL	00350821044888	Grey	No	
019	0089_MW289	Clear Plastic Bottle - Natural	250 mL	00070621079343	Green	No	
020	0089_QC301	HDPE (no PTFE)	20 mL	00350621046606	Grey	No	
020	0089_QC301	HDPE (no PTFE)	20 mL	00350621046322	Grey	No	
021	0089_QC401	HDPE (no PTFE)	20 mL	00350621046683	Grey	No	
021	0089_QC401	HDPE (no PTFE)	20 mL	00350621046562	Grey	No	

Total Bottle Count: ALS: 65, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203138**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19 B)
C-O-C number	: 35210	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 18-Mar-2022 16:15	Issue Date	: 21-Mar-2022
Client Requested Due Date	: 29-Mar-2022	Scheduled Reporting Date	: **29-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 9.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 21 / 21

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2203138-001	17-Mar-2022 08:56	0089_MW199_220317	✓	✓	✓	✓
EP2203138-002	17-Mar-2022 09:10	0089_MW203_220317	✓	✓	✓	✓
EP2203138-003	17-Mar-2022 09:31	0089_MW517_220317	✓	✓	✓	✓
EP2203138-004	17-Mar-2022 09:53	0089_MW255_220317	✓	✓	✓	✓
EP2203138-005	17-Mar-2022 10:07	0089_MW256_220317	✓	✓	✓	✓
EP2203138-006	17-Mar-2022 10:19	0089_MW259_220317	✓	✓	✓	✓
EP2203138-007	17-Mar-2022 10:37	0089_MW257_220317	✓	✓	✓	✓
EP2203138-008	17-Mar-2022 11:17	0089_MW010_220317	✓	✓	✓	✓
EP2203138-009	17-Mar-2022 11:32	0089_MW261_220317	✓	✓	✓	✓
EP2203138-010	17-Mar-2022 11:53	0089_MW233_220317	✓	✓	✓	✓
EP2203138-011	17-Mar-2022 12:38	0089_MW217_220317	✓	✓	✓	✓
EP2203138-012	17-Mar-2022 12:51	0089_MW282_220317	✓	✓	✓	✓
EP2203138-013	17-Mar-2022 13:04	0089_MW224_220317	✓	✓	✓	✓
EP2203138-014	17-Mar-2022 13:29	0089_MW268_220317	✓	✓	✓	✓
EP2203138-015	17-Mar-2022 13:57	0089_MW269_220317	✓	✓	✓	✓
EP2203138-016	17-Mar-2022 14:19	0089_MW516_220317	✓	✓	✓	✓
EP2203138-017	17-Mar-2022 14:31	0089_MW249_220317	✓	✓	✓	✓
EP2203138-018	17-Mar-2022 14:50	0089_MW242_220317	✓	✓	✓	✓
EP2203138-019	17-Mar-2022 15:13	0089_MW289_220317	✓	✓	✓	✓
EP2203138-020	17-Mar-2022 15:18	0089_QC301_220317		✓		
EP2203138-021	17-Mar-2022 15:19	0089_QC401_220317		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]

DERP LAB REPORTS

- EDI Format - ESDAT (ESDAT)	Email	[redacted]

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203138**	Page	: 1 of 17
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022 16:15
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35210	Issue Date	: 29-Mar-2022 17:34
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 21		
No. of samples analysed	: 21		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Positive result for analyte Perfluorohexane sulfonic acid (PFHxS) and on sample EP2203138_009 has been confirmed by re-extraction and re-analysis.
- EP231X: Positive result for analyte Perfluorooctane sulfonic acid (PFOS) and on sample EP2203138_003 has been confirmed by re-extraction and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_220317	0089_MW203_220317	0089_MW517_220317	0089_MW255_220317	0089_MW256_220317
				Sampling date / time	17-Mar-2022 08:56	17-Mar-2022 09:10	17-Mar-2022 09:31	17-Mar-2022 09:53	17-Mar-2022 10:07
Compound	CAS Number	LOR	Unit		EP2203138-001	EP2203138-002	EP2203138-003	EP2203138-004	EP2203138-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		441	291	257	258	473
Total Alkalinity as CaCO3	----	1	mg/L		441	291	257	258	473
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		464	72	13	34	109
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		3880	67	637	67	867
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		173	83	217	92	188
Magnesium	7439-95-4	1	mg/L		291	45	34	13	83
Sodium	7440-23-5	1	mg/L		2310	56	257	54	376
Potassium	7440-09-7	1	mg/L		108	7	5	5	8
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		128	9.20	23.4	7.75	36.2
ø Total Cations	----	0.01	meq/L		136	10.5	24.9	8.14	32.8
ø Ionic Balance	----	0.01	%		3.00	6.39	3.23	2.42	4.94
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	0.11	3.22
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	0.06	1.54
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.05	<0.01	0.55	10.7
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.55
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	0.01	0.32	10.7
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	1.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	0.04	1.47
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	0.23	5.22
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.41

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_220317	0089_MW203_220317	0089_MW517_220317	0089_MW255_220317	0089_MW256_220317
				Sampling date / time	17-Mar-2022 08:56	17-Mar-2022 09:10	17-Mar-2022 09:31	17-Mar-2022 09:53	17-Mar-2022 10:07
Compound	CAS Number	LOR	Unit		EP2203138-001	EP2203138-002	EP2203138-003	EP2203138-004	EP2203138-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.01**	**0.72**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.02**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.08**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**0.23**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW199_220317	0089_MW203_220317	0089_MW517_220317	0089_MW255_220317	0089_MW256_220317
				Sampling date / time	17-Mar-2022 08:56	17-Mar-2022 09:10	17-Mar-2022 09:31	17-Mar-2022 09:53	17-Mar-2022 10:07
					EP2203138-001	EP2203138-002	EP2203138-003	EP2203138-004	EP2203138-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.05**	**0.01**	**1.32**	**36.0**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.05**	**0.01**	**0.87**	**21.4**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.05**	**0.01**	**1.26**	**33.8**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.9**	**99.2**	**104**	**101**	**102**
13C8-PFOA	----	0.02	%		**101**	**104**	**104**	**108**	**96.9**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW259_220317	0089_MW257_220317	0089_MW010_220317	0089_MW261_220317	0089_MW233_220317
				Sampling date / time	17-Mar-2022 10:19	17-Mar-2022 10:37	17-Mar-2022 11:17	17-Mar-2022 11:32	17-Mar-2022 11:53
Compound	CAS Number	LOR	Unit		EP2203138-006	EP2203138-007	EP2203138-008	EP2203138-009	EP2203138-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		185	180	428	415	91
Total Alkalinity as CaCO3	----	1	mg/L		185	180	428	415	91
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		17	14	80	83	4
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		42	37	246	152	54
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		61	68	119	108	40
Magnesium	7439-95-4	1	mg/L		16	8	39	20	4
Sodium	7440-23-5	1	mg/L		22	24	157	142	18
Potassium	7440-09-7	1	mg/L		1	4	17	14	2
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		5.24	4.93	17.2	14.3	3.42
ø Total Cations	----	0.01	meq/L		5.34	5.20	16.4	13.6	3.16
ø Ionic Balance	----	0.01	%		1.02	2.63	2.22	2.64	4.03
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.08	0.06	0.20	0.03	0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.18	0.02	0.05	<0.01	0.24
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.54	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.44	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW259_220317	0089_MW257_220317	0089_MW010_220317	0089_MW261_220317	0089_MW233_220317
				Sampling date / time	17-Mar-2022 10:19	17-Mar-2022 10:37	17-Mar-2022 11:17	17-Mar-2022 11:32	17-Mar-2022 11:53
Compound	CAS Number	LOR	Unit		EP2203138-006	EP2203138-007	EP2203138-008	EP2203138-009	EP2203138-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW259_220317	0089_MW257_220317	0089_MW010_220317	0089_MW261_220317	0089_MW233_220317
				Sampling date / time	17-Mar-2022 10:19	17-Mar-2022 10:37	17-Mar-2022 11:17	17-Mar-2022 11:32	17-Mar-2022 11:53
					EP2203138-006	EP2203138-007	EP2203138-008	EP2203138-009	EP2203138-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.38**	**0.08**	**0.25**	**0.03**	**0.25**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.26**	**0.08**	**0.25**	**0.03**	**0.25**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.36**	**0.08**	**0.25**	**0.03**	**0.25**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.7**	**89.7**	**95.1**	**98.9**	**100**
13C8-PFOA	----	0.02	%		**101**	**102**	**103**	**100**	**100**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_220317	0089_MW282_220317	0089_MW224_220317	0089_MW268_220317	0089_MW269_220317
				Sampling date / time	17-Mar-2022 12:38	17-Mar-2022 12:51	17-Mar-2022 13:04	17-Mar-2022 13:29	17-Mar-2022 13:57
Compound	CAS Number	LOR	Unit		EP2203138-011	EP2203138-012	EP2203138-013	EP2203138-014	EP2203138-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		267	544	233	445	413
Total Alkalinity as CaCO3	----	1	mg/L		267	544	233	445	413
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		59	20	38	746	91
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		60	62	121	1020	258
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		125	208	66	210	90
Magnesium	7439-95-4	1	mg/L		14	25	21	201	50
Sodium	7440-23-5	1	mg/L		53	41	91	584	166
Potassium	7440-09-7	1	mg/L		10	1	4	36	16
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		8.26	13.0	8.86	53.2	17.4
ø Total Cations	----	0.01	meq/L		9.95	14.2	9.08	53.3	16.2
ø Ionic Balance	----	0.01	%		9.31	4.44	1.24	0.14	3.53
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.05	3.02	<0.02	0.07	0.06
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.03	6.09	<0.02	0.06	0.10
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	63.0	0.02	0.33	0.52
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	9.56	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.09	76.9	0.06	0.02	0.56
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		1.7	1.0	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		8.38	1.83	<0.02	<0.02	0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		13.2	12.6	<0.02	0.05	0.14
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.92	2.81	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_220317	0089_MW282_220317	0089_MW224_220317	0089_MW268_220317	0089_MW269_220317
				Sampling date / time	17-Mar-2022 12:38	17-Mar-2022 12:51	17-Mar-2022 13:04	17-Mar-2022 13:29	17-Mar-2022 13:57
Compound	CAS Number	LOR	Unit		EP2203138-011	EP2203138-012	EP2203138-013	EP2203138-014	EP2203138-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.43**	**12.0**	<0.01	<0.01	**0.01**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.04**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**27.2**	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.48**	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW217_220317	0089_MW282_220317	0089_MW224_220317	0089_MW268_220317	0089_MW269_220317
				Sampling date / time	17-Mar-2022 12:38	17-Mar-2022 12:51	17-Mar-2022 13:04	17-Mar-2022 13:29	17-Mar-2022 13:57
					EP2203138-011	EP2203138-012	EP2203138-013	EP2203138-014	EP2203138-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**52.5**	**189**	**0.08**	**0.53**	**1.41**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.11**	**140**	**0.08**	**0.35**	**1.08**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**52.5**	**173**	**0.08**	**0.47**	**1.31**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**66.6**	**94.0**	**99.1**	**95.5**
13C8-PFOA	----	0.02	%		**102**	**97.6**	**104**	**98.1**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW516_220317	0089_MW249_220317	0089_MW242_220317	0089_MW289_220317	----
				Sampling date / time	17-Mar-2022 14:19	17-Mar-2022 14:31	17-Mar-2022 14:50	17-Mar-2022 15:13	----
Compound	CAS Number	LOR	Unit		EP2203138-016	EP2203138-017	EP2203138-018	EP2203138-019	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**468**	**418**	**186**	**422**	----
Total Alkalinity as CaCO3	----	1	mg/L		**468**	**418**	**186**	**422**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**108**	**51**	**25**	**82**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**180**	**116**	**15**	**101**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**128**	**103**	**66**	**153**	----
Magnesium	7439-95-4	1	mg/L		**51**	**42**	**11**	**32**	----
Sodium	7440-23-5	1	mg/L		**114**	**89**	**12**	**89**	----
Potassium	7440-09-7	1	mg/L		**20**	**10**	**1**	**10**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**16.7**	**12.7**	**4.66**	**13.0**	----
ø Total Cations	----	0.01	meq/L		**16.0**	**12.7**	**4.75**	**14.4**	----
ø Ionic Balance	----	0.01	%		**1.90**	**0.15**	**0.92**	**5.14**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.10**	<0.02	<0.02	**0.11**	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.04**	<0.02	<0.02	**0.08**	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.84**	**0.07**	<0.01	**0.49**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.11**	<0.02	<0.02	**0.02**	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**8.54**	**0.03**	**0.03**	**0.36**	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.11**	<0.02	<0.02	**0.06**	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.11**	<0.02	<0.02	**0.20**	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.04**	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW516_220317	0089_MW249_220317	0089_MW242_220317	0089_MW289_220317	----
				Sampling date / time	17-Mar-2022 14:19	17-Mar-2022 14:31	17-Mar-2022 14:50	17-Mar-2022 15:13	----
Compound	CAS Number	LOR	Unit		EP2203138-016	EP2203138-017	EP2203138-018	EP2203138-019	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.07**	<0.01	<0.01	**0.05**	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW516_220317	0089_MW249_220317	0089_MW242_220317	0089_MW289_220317	----
				Sampling date / time	17-Mar-2022 14:19	17-Mar-2022 14:31	17-Mar-2022 14:50	17-Mar-2022 15:13	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2203138-016**	**EP2203138-017**	**EP2203138-018**	**EP2203138-019**	**--------**
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**----**
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**9.92**	**0.10**	**0.03**	**1.41**	**----**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**9.38**	**0.10**	**0.03**	**0.85**	**----**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**9.77**	**0.10**	**0.03**	**1.31**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.6**	**95.4**	**102**	**96.4**	**----**
13C8-PFOA	----	0.02	%		**99.9**	**105**	**99.7**	**101**	**----**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220317	0089_QC401_220317	----	----	----
				Sampling date / time	17-Mar-2022 15:18	17-Mar-2022 15:19	----	----	----
Compound	CAS Number	LOR	Unit		EP2203138-020	EP2203138-021	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220317	0089_QC401_220317	----	----	----
				Sampling date / time	17-Mar-2022 15:18	17-Mar-2022 15:19	----	----	----
Compound	CAS Number	LOR	Unit		EP2203138-020	EP2203138-021	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.3**	**101**	----	----	----
13C8-PFOA	----	0.02	%		**102**	**104**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203138**	Page	: 1 of 11
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35210	Issue Date	: 29-Mar-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 21		
No. of samples analysed	: 21		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4247621)									
EP2203057-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	352	359	2.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	352	359	2.1	0% - 20%
EP2203138-004	0089_MW255_220317	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	258	259	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	258	259	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4247622)									
EP2203138-014	0089_MW268_220317	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	445	451	1.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	445	451	1.2	0% - 20%
EP2203194-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	264	265	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	264	265	0.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4240551)									
EP2203138-001	0089_MW199_220317	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	464	455	2.0	0% - 20%
EP2203308-030	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7890	7950	0.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4240555)									
EP2203138-002	0089_MW203_220317	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	72	71	0.0	0% - 20%
EP2203138-012	0089_MW282_220317	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	20	22	8.1	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 4240550)									
EP2203138-001	0089_MW199_220317	ED045G: Chloride	16887-00-6	1	mg/L	3880	3880	0.0	0% - 20%
EP2203308-030	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	39800	39700	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4240554)									
EP2203138-002	0089_MW203_220317	ED045G: Chloride	16887-00-6	1	mg/L	67	67	0.0	0% - 20%
EP2203138-012	0089_MW282_220317	ED045G: Chloride	16887-00-6	1	mg/L	62	61	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4241846)									
EP2203115-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	414	424	2.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1360	1400	3.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9990	10300	3.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	290	301	3.8	0% - 20%
EP2203138-007	0089_MW257_220317	ED093F: Calcium	7440-70-2	1	mg/L	68	69	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	8	8	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	24	24	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4241847)									
EP2203138-017	0089_MW249_220317	ED093F: Calcium	7440-70-2	1	mg/L	103	103	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	42	42	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	89	88	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	10	10	0.0	0% - 50%
EP2203272-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	55	55	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	68	69	2.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	119	121	1.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4243469)									
EP2203057-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4243470)									
EP2203138-014	0089_MW268_220317	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.33	0.32	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.07	0.09	24.1	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4243469)									
EP2203057-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4243469) - continued									
EP2203057-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4243470)									
EP2203138-014	0089_MW268_220317	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4243469)									
EP2203057-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4243470)									
EP2203138-014	0089_MW268_220317	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4243470) - continued									
EP2203138-014	0089_MW268_220317	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4243469)									
EP2203057-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4243470)									
EP2203138-014	0089_MW268_220317	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4243469)									
EP2203057-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4243470)									
EP2203138-014	0089_MW268_220317	EP231X: Sum of PFAS	----	0.01	µg/L	0.53	0.54	1.9	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4247621)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	98.6	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4247622)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	109	81.2	126
				<1	200 mg/L	101	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240551)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.4	87.7	113
				<1	500 mg/L	102	87.7	113
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240555)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.4	87.7	113
				<1	500 mg/L	102	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4240550)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	87.9	114
				<1	1000 mg/L	105	87.9	114
ED045G: Chloride by Discrete Analyser (QCLot: 4240554)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.2	87.9	114
				<1	1000 mg/L	105	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4241846)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.0	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	93.2	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.7	89.7	108
ED093F: Dissolved Major Cations (QCLot: 4241847)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	92.4	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	89.4	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	87.3	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 4241847) - continued								
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.0	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243469)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	100	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	96.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243470)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	85.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	86.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	84.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	84.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	70.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243469)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	104	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	103	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243470)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	78.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	99.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	95.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	74.4	65.0	144

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243470) - continued								
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243469)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.8	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	107	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	125	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	98.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243470)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	82.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	65.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	78.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	86.9	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243469)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	87.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	123	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.0	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243470)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	97.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	99.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	73.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	135	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240551)							
EP2203138-001	0089_MW199_220317	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240555)							
EP2203138-002	0089_MW203_220317	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	106	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4240550)							
EP2203138-001	0089_MW199_220317	ED045G: Chloride	16887-00-6	1000 mg/L	99.1	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4240554)							
EP2203138-002	0089_MW203_220317	ED045G: Chloride	16887-00-6	1000 mg/L	102	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243469)							
EP2203138-004	0089_MW255_220317	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	107	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	86.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	70.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	83.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	96.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243470)							
EP2203194-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	105	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	104	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	98.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	123	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	102	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243469)							
EP2203138-004	0089_MW255_220317	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	99.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	116	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	97.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	91.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	101	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	115	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	91.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	116	71.0	132

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243470)							
EP2203194-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	90.8	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	110	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	126	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	113	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	103	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	110	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	110	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	117	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	118	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243469)							
EP2203138-004	0089_MW255_220317	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	108	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	108	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	90.4	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	112	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	119	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	89.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243470)							
EP2203194-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	115	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	101	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	87.9	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	97.4	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	114	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	104	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	94.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243469)							
EP2203138-004	0089_MW255_220317	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	108	63.0	143

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243469) - continued							
EP2203138-004	0089_MW255_220317	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	94.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	82.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243470)							
EP2203194-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	84.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	106	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	89.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	76.0	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203138**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022
Site	: DEF19009/Stirling GW - AG	Issue Date	: 29-Mar-2022
Sampler	: [redacted]	No. of samples received	: 21
Order number	: DEF19009/730	No. of samples analysed	: 21

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2203138--001	0089_MW199_220317	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2203194--006	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	37	5.41	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW199_220317, 0089_MW203_220317, 0089_MW517_220317, 0089_MW255_220317, 0089_MW256_220317, 0089_MW259_220317, 0089_MW257_220317, 0089_MW010_220317, 0089_MW261_220317, 0089_MW233_220317, 0089_MW217_220317, 0089_MW282_220317, 0089_MW224_220317, 0089_MW268_220317, 0089_MW269_220317, 0089_MW516_220317, 0089_MW249_220317, 0089_MW242_220317, 0089_MW289_220317	**17-Mar-2022**	**----**	----	----	**24-Mar-2022**	31-Mar-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW199_220317	**17-Mar-2022**	**----**	----	----	**28-Mar-2022**	14-Apr-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_MW203_220317, 0089_MW517_220317, 0089_MW255_220317, 0089_MW256_220317, 0089_MW259_220317, 0089_MW257_220317, 0089_MW010_220317, 0089_MW261_220317, 0089_MW233_220317, 0089_MW217_220317, 0089_MW282_220317, 0089_MW224_220317, 0089_MW268_220317, 0089_MW269_220317, 0089_MW516_220317, 0089_MW249_220317, 0089_MW242_220317, 0089_MW289_220317	**17-Mar-2022**	**----**	----	----	**29-Mar-2022**	14-Apr-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW199_220317	**17-Mar-2022**	**----**	----	----	**28-Mar-2022**	14-Apr-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_MW203_220317, 0089_MW517_220317, 0089_MW255_220317, 0089_MW256_220317, 0089_MW259_220317, 0089_MW257_220317, 0089_MW010_220317, 0089_MW261_220317, 0089_MW233_220317, 0089_MW217_220317, 0089_MW282_220317, 0089_MW224_220317, 0089_MW268_220317, 0089_MW269_220317, 0089_MW516_220317, 0089_MW249_220317, 0089_MW242_220317, 0089_MW289_220317	**17-Mar-2022**	**----**	----	----	**29-Mar-2022**	14-Apr-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW199_220317, 0089_MW203_220317, 0089_MW517_220317, 0089_MW255_220317, 0089_MW256_220317, 0089_MW259_220317, 0089_MW257_220317, 0089_MW010_220317, 0089_MW261_220317, 0089_MW233_220317, 0089_MW217_220317, 0089_MW282_220317, 0089_MW224_220317, 0089_MW268_220317, 0089_MW269_220317, 0089_MW516_220317, 0089_MW249_220317, 0089_MW242_220317, 0089_MW289_220317	**17-Mar-2022**	**----**	----	----	**22-Mar-2022**	24-Mar-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW224_220317, 0089_MW268_220317, 0089_MW269_220317, 0089_MW516_220317, 0089_MW249_220317, 0089_MW242_220317, 0089_MW289_220317, 0089_QC301_220317, 0089_QC401_220317	**17-Mar-2022**	**23-Mar-2022**	13-Sep-2022	✓	**23-Mar-2022**	13-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_MW199_220317, 0089_MW203_220317, 0089_MW517_220317, 0089_MW255_220317, 0089_MW256_220317, 0089_MW259_220317, 0089_MW257_220317, 0089_MW010_220317, 0089_MW261_220317, 0089_MW233_220317, 0089_MW217_220317, 0089_MW282_220317	**17-Mar-2022**	**24-Mar-2022**	13-Sep-2022	✓	**24-Mar-2022**	13-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW224_220317, 0089_MW268_220317, 0089_MW269_220317, 0089_MW516_220317, 0089_MW249_220317, 0089_MW242_220317, 0089_MW289_220317, 0089_QC301_220317, 0089_QC401_220317	**17-Mar-2022**	**23-Mar-2022**	13-Sep-2022	✓	**23-Mar-2022**	13-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_MW199_220317, 0089_MW203_220317, 0089_MW517_220317, 0089_MW255_220317, 0089_MW256_220317, 0089_MW259_220317, 0089_MW257_220317, 0089_MW010_220317, 0089_MW261_220317, 0089_MW233_220317, 0089_MW217_220317, 0089_MW282_220317	**17-Mar-2022**	**24-Mar-2022**	13-Sep-2022	✓	**24-Mar-2022**	13-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW224_220317, 0089_MW268_220317, 0089_MW269_220317, 0089_MW516_220317, 0089_MW249_220317, 0089_MW242_220317, 0089_MW289_220317, 0089_QC301_220317, 0089_QC401_220317	**17-Mar-2022**	**23-Mar-2022**	13-Sep-2022	✓	**23-Mar-2022**	13-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_MW199_220317, 0089_MW203_220317, 0089_MW517_220317, 0089_MW255_220317, 0089_MW256_220317, 0089_MW259_220317, 0089_MW257_220317, 0089_MW010_220317, 0089_MW261_220317, 0089_MW233_220317, 0089_MW217_220317, 0089_MW282_220317	**17-Mar-2022**	**24-Mar-2022**	13-Sep-2022	✓	**24-Mar-2022**	13-Sep-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW224_220317, 0089_MW268_220317, 0089_MW269_220317, 0089_MW516_220317, 0089_MW249_220317, 0089_MW242_220317, 0089_MW289_220317, 0089_QC301_220317, 0089_QC401_220317	**17-Mar-2022**	**23-Mar-2022**	13-Sep-2022	✓	**23-Mar-2022**	13-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_MW199_220317, 0089_MW203_220317, 0089_MW517_220317, 0089_MW255_220317, 0089_MW256_220317, 0089_MW259_220317, 0089_MW257_220317, 0089_MW010_220317, 0089_MW261_220317, 0089_MW233_220317, 0089_MW217_220317, 0089_MW282_220317	**17-Mar-2022**	**24-Mar-2022**	13-Sep-2022	✓	**24-Mar-2022**	13-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW224_220317, 0089_MW268_220317, 0089_MW269_220317, 0089_MW516_220317, 0089_MW249_220317, 0089_MW242_220317, 0089_MW289_220317, 0089_QC301_220317, 0089_QC401_220317	**17-Mar-2022**	**23-Mar-2022**	13-Sep-2022	✓	**23-Mar-2022**	13-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
0089_MW199_220317, 0089_MW203_220317, 0089_MW517_220317, 0089_MW255_220317, 0089_MW256_220317, 0089_MW259_220317, 0089_MW257_220317, 0089_MW010_220317, 0089_MW261_220317, 0089_MW233_220317, 0089_MW217_220317, 0089_MW282_220317	**17-Mar-2022**	**24-Mar-2022**	13-Sep-2022	✓	**24-Mar-2022**	13-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: **35271** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW245		18/03/2022 08:29 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW239		18/03/2022 08:41 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_MW238		18/03/2022 08:50 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW240		18/03/2022 09:00 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW243		18/03/2022 09:08 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW288		18/03/2022 09:42 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab qaqc
007	0089_MW202		18/03/2022 11:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_QC301		18/03/2022 11:30 AM	Water	ALS: 2 Non ALS: 0	No		X		
009	0089_QC401		18/03/2022 11:30 AM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 35271 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW245	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW239	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW238	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW240	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW243	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW288	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW202	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 35271 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW245	HDPE (no PTFE)	20 mL	00350821044875	Grey	No	
001	0089_MW245	Clear Plastic Bottle - Natural	250 mL	00070621079256	Green	No	
001	0089_MW245	HDPE (no PTFE)	20 mL	00350821044906	Grey	No	
002	0089_MW239	Clear Plastic Bottle - Natural	250 mL	00070621079246	Green	No	
002	0089_MW239	HDPE (no PTFE)	20 mL	00350821044832	Grey	No	
002	0089_MW239	HDPE (no PTFE)	20 mL	00350821044822	Grey	No	
003	0089_MW238	Clear Plastic Bottle - Natural	250 mL	00070621079214	Green	No	
003	0089_MW238	HDPE (no PTFE)	20 mL	00350821044809	Grey	No	
003	0089_MW238	HDPE (no PTFE)	20 mL	00350621043686	Grey	No	
004	0089_MW240	HDPE (no PTFE)	20 mL	00350821044827	Grey	No	
004	0089_MW240	HDPE (no PTFE)	20 mL	00350621043757	Grey	No	
004	0089_MW240	Clear Plastic Bottle - Natural	250 mL	00070621061599	Green	No	
005	0089_MW243	Clear Plastic Bottle - Natural	250 mL	00070621079278	Green	No	
005	0089_MW243	HDPE (no PTFE)	20 mL	00350821044859	Grey	No	
005	0089_MW243	HDPE (no PTFE)	20 mL	00350821044860	Grey	No	
006	0089_MW288	Clear Plastic Bottle - Natural	250 mL	00070621079220	Green	No	
006	0089_MW288	HDPE (no PTFE)	20 mL	00350621043753	Grey	No	
006	0089_MW288	HDPE (no PTFE)	20 mL	00350621046307	Grey	No	
006	0089_MW288	HDPE (no PTFE)	20 mL	00350621046447	Grey	No	
006	0089_MW288	HDPE (no PTFE)	20 mL	00350821044897	Grey	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00350621043681	Grey	No	
007	0089_MW202	Clear Plastic Bottle - Natural	250 mL	00070621080013	Green	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00350621043730	Grey	No	
008	0089_QC301	HDPE (no PTFE)	20 mL	00350621046226	Grey	No	
008	0089_QC301	HDPE (no PTFE)	20 mL	00350621046521	Grey	No	
009	0089_QC401	HDPE (no PTFE)	20 mL	00350621046286	Grey	No	

CHAIN OF CUSTODY

COC#: **35271** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling GW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_QC401	HDPE (no PTFE)	20 mL	00350621046758	Grey	No	

Total Bottle Count: ALS: 27, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203194**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19 B)
C-O-C number	: 35271	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling GW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 18-Mar-2022 16:15	Issue Date	: 21-Mar-2022
Client Requested Due Date	: 29-Mar-2022	Scheduled Reporting Date	: **29-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 9.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2203194-001	18-Mar-2022 08:29	0089_MW245_220318	✓	✓	✓	✓
EP2203194-002	18-Mar-2022 08:41	0089_MW239_220318	✓	✓	✓	✓
EP2203194-003	18-Mar-2022 08:50	0089_MW238_220318	✓	✓	✓	✓
EP2203194-004	18-Mar-2022 09:00	0089_MW240_220318	✓	✓	✓	✓
EP2203194-005	18-Mar-2022 09:08	0089_MW243_220318	✓	✓	✓	✓
EP2203194-006	18-Mar-2022 09:42	0089_MW288_220318	✓	✓	✓	✓
EP2203194-007	18-Mar-2022 11:21	0089_MW202_220318	✓	✓	✓	✓
EP2203194-008	18-Mar-2022 11:30	0089_QC301_220318		✓		
EP2203194-009	18-Mar-2022 11:30	0089_QC401_220318		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203194**	Page	: 1 of 11
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022 16:15
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35271	Issue Date	: 29-Mar-2022 12:55
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- ED041G (Sulfate Turbidimetric): LOR for sample EP2203194-001 raised due to possible sample matrix interference.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW245_220318	0089_MW239_220318	0089_MW238_220318	0089_MW240_220318	0089_MW243_220318
				Sampling date / time	18-Mar-2022 08:29	18-Mar-2022 08:41	18-Mar-2022 08:50	18-Mar-2022 09:00	18-Mar-2022 09:08
					EP2203194-001	EP2203194-002	EP2203194-003	EP2203194-004	EP2203194-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**346**	**238**	**206**	**245**	**264**
Total Alkalinity as CaCO3	----	1	mg/L		**346**	**238**	**206**	**245**	**264**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<2	**84**	**77**	**69**	**52**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**37**	**32**	**38**	**64**	**84**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**118**	**88**	**92**	**133**	**128**
Magnesium	7439-95-4	1	mg/L		**12**	**20**	**17**	**15**	**18**
Sodium	7440-23-5	1	mg/L		**28**	**28**	**26**	**33**	**50**
Potassium	7440-09-7	1	mg/L		**5**	**4**	**4**	**4**	**5**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**7.96**	**7.41**	**6.79**	**8.14**	**8.73**
ø Total Cations	----	0.01	meq/L		**8.22**	**7.36**	**7.22**	**9.41**	**10.2**
ø Ionic Balance	----	0.01	%		**1.64**	**0.33**	**3.08**	**7.25**	**7.64**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.03**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	**0.02**	**0.01**	**1.07**	**0.04**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.07**	<0.01	<0.01	<0.01	**0.01**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.08**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW245_220318	0089_MW239_220318	0089_MW238_220318	0089_MW240_220318	0089_MW243_220318
				Sampling date / time	18-Mar-2022 08:29	18-Mar-2022 08:41	18-Mar-2022 08:50	18-Mar-2022 09:00	18-Mar-2022 09:08
Compound	CAS Number	LOR	Unit		EP2203194-001	EP2203194-002	EP2203194-003	EP2203194-004	EP2203194-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.01**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW245_220318	0089_MW239_220318	0089_MW238_220318	0089_MW240_220318	0089_MW243_220318
				Sampling date / time	18-Mar-2022 08:29	18-Mar-2022 08:41	18-Mar-2022 08:50	18-Mar-2022 09:00	18-Mar-2022 09:08
					EP2203194-001	EP2203194-002	EP2203194-003	EP2203194-004	EP2203194-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.08**	**0.05**	**0.01**	**1.16**	**0.05**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.08**	**0.02**	**0.01**	**1.07**	**0.05**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.08**	**0.02**	**0.01**	**1.16**	**0.05**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**102**	**94.6**	**86.9**	**95.6**
13C8-PFOA	----	0.02	%		**99.0**	**97.9**	**90.8**	**86.7**	**85.2**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_220318	0089_MW202_220318	----	----	----
				Sampling date / time	18-Mar-2022 09:42	18-Mar-2022 11:21	----	----	----
Compound	CAS Number	LOR	Unit		EP2203194-006	EP2203194-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**244**	**349**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**244**	**349**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**59**	**70**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**56**	**249**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**97**	**115**	----	----	----
Magnesium	7439-95-4	1	mg/L		**24**	**32**	----	----	----
Sodium	7440-23-5	1	mg/L		**41**	**136**	----	----	----
Potassium	7440-09-7	1	mg/L		**6**	**13**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**7.68**	**15.4**	----	----	----
ø Total Cations	----	0.01	meq/L		**8.75**	**14.6**	----	----	----
ø Ionic Balance	----	0.01	%		**6.50**	**2.77**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.05**	**0.03**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**3.18**	**0.04**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.03**	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_220318	0089_MW202_220318	----	----	----
				Sampling date / time	18-Mar-2022 09:42	18-Mar-2022 11:21	----	----	----
Compound	CAS Number	LOR	Unit		EP2203194-006	EP2203194-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_220318	0089_MW202_220318	----	----	----
				Sampling date / time	18-Mar-2022 09:42	18-Mar-2022 11:21	----	----	----
Compound	CAS Number	LOR	Unit		EP2203194-006	EP2203194-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**3.26**	**0.07**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**3.23**	**0.07**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**3.26**	**0.07**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.2**	**95.9**	----	----	----
13C8-PFOA	----	0.02	%		**89.0**	**87.9**	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220318	0089_QC401_220318	----	----	----
				Sampling date / time	18-Mar-2022 11:30	18-Mar-2022 11:30	----	----	----
Compound	CAS Number	LOR	Unit		EP2203194-008	EP2203194-009	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220318	0089_QC401_220318	----	----	----
				Sampling date / time	18-Mar-2022 11:30	18-Mar-2022 11:30	----	----	----
Compound	CAS Number	LOR	Unit		EP2203194-008	EP2203194-009	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.0**	**87.9**	----	----	----
13C8-PFOA	----	0.02	%		**85.4**	**87.0**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203194**	Page	: 1 of 8
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35271	Issue Date	: 29-Mar-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4247622)									
EP2203138-014	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	445	451	1.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	445	451	1.2	0% - 20%
EP2203194-005	0089_MW243_220318	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	264	265	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	264	265	0.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4240555)									
EP2203138-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	72	71	0.0	0% - 20%
EP2203138-012	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	20	22	8.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4240557)									
EP2203194-003	0089_MW238_220318	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	77	78	2.1	0% - 20%
EP2203195-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2710	2680	1.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4240554)									
EP2203138-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	67	67	0.0	0% - 20%
EP2203138-012	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	62	61	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4240556)									
EP2203194-003	0089_MW238_220318	ED045G: Chloride	16887-00-6	1	mg/L	38	39	0.0	0% - 20%
EP2203195-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19100	19100	0.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4241856)									
EP2203194-001	0089_MW245_220318	ED093F: Calcium	7440-70-2	1	mg/L	118	119	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	12	12	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4241856) - continued									
EP2203194-001	0089_MW245_220318	ED093F: Sodium	7440-23-5	1	mg/L	28	28	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
EP2203195-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	466	475	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1440	1480	2.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11100	11400	2.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	541	556	2.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4243470)									
EP2203138-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.33	0.32	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.07	0.09	24.1	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4243470)									
EP2203138-014	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4243470)									
EP2203138-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4243470)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4243470) - continued									
EP2203138-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4243470)									
EP2203138-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.53	0.54	1.9	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4247622)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	109	81.2	126
				<1	200 mg/L	101	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240555)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.4	87.7	113
				<1	500 mg/L	102	87.7	113
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240557)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.5	87.7	113
				<1	500 mg/L	103	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4240554)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.2	87.9	114
				<1	1000 mg/L	105	87.9	114
ED045G: Chloride by Discrete Analyser (QCLot: 4240556)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.9	87.9	114
				<1	1000 mg/L	106	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4241856)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.5	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	93.8	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.4	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243470)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	85.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	86.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	84.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	84.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	70.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243470)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	78.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243470) - continued								
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	99.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	95.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	74.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243470)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	82.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	65.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	78.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	86.9	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243470)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	97.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	99.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	73.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	135	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240555)							
EP2203138-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	106	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240557)							
EP2203194-003	0089_MW238_220318	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	105	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4240554)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 4240554) - continued							
EP2203138-002	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	102	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4240556)							
EP2203194-003	0089_MW238_220318	ED045G: Chloride	16887-00-6	1000 mg/L	103	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4243470)							
EP2203194-006	0089_MW288_220318	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	105	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	104	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	98.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	123	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	102	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4243470)							
EP2203194-006	0089_MW288_220318	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	90.8	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	110	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	126	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	113	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	103	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	110	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	110	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	117	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	118	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4243470)							
EP2203194-006	0089_MW288_220318	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	115	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	101	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	87.9	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	97.4	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	114	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	104	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	94.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243470)							
EP2203194-006	0089_MW288_220318	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	84.6	63.0	143

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4243470) - continued							
EP2203194-006	0089_MW288_220318	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	106	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	89.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	76.0	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203194**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022
Site	: DEF19009/Stirling GW - AG	Issue Date	: 29-Mar-2022
Sampler	: [redacted]	No. of samples received	: 9
Order number	: DEF19009/730	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2203194--006	0089_MW288_220318	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	18	5.56	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW245_220318, 0089_MW239_220318, 0089_MW238_220318, 0089_MW240_220318, 0089_MW243_220318, 0089_MW288_220318, 0089_MW202_220318	**18-Mar-2022**	**----**	----	----	**24-Mar-2022**	01-Apr-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW245_220318, 0089_MW239_220318, 0089_MW238_220318, 0089_MW240_220318, 0089_MW243_220318, 0089_MW288_220318, 0089_MW202_220318	**18-Mar-2022**	**----**	----	----	**29-Mar-2022**	15-Apr-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW245_220318, 0089_MW239_220318, 0089_MW238_220318, 0089_MW240_220318, 0089_MW243_220318, 0089_MW288_220318, 0089_MW202_220318	**18-Mar-2022**	**----**	----	----	**29-Mar-2022**	15-Apr-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW245_220318, 0089_MW239_220318, 0089_MW238_220318, 0089_MW240_220318, 0089_MW243_220318, 0089_MW288_220318, 0089_MW202_220318	**18-Mar-2022**	**----**	----	----	**22-Mar-2022**	25-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW245_220318, 0089_MW239_220318, 0089_MW238_220318, 0089_MW240_220318, 0089_MW243_220318, 0089_MW288_220318, 0089_MW202_220318, 0089_QC301_220318, 0089_QC401_220318	**18-Mar-2022**	**23-Mar-2022**	14-Sep-2022	✓	**23-Mar-2022**	14-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW245_220318, 0089_MW239_220318, 0089_MW238_220318, 0089_MW240_220318, 0089_MW243_220318, 0089_MW288_220318, 0089_MW202_220318, 0089_QC301_220318, 0089_QC401_220318	**18-Mar-2022**	**23-Mar-2022**	14-Sep-2022	✓	**23-Mar-2022**	14-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW245_220318, 0089_MW239_220318, 0089_MW238_220318, 0089_MW240_220318, 0089_MW243_220318, 0089_MW288_220318, 0089_MW202_220318, 0089_QC301_220318, 0089_QC401_220318	**18-Mar-2022**	**23-Mar-2022**	14-Sep-2022	✓	**23-Mar-2022**	14-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW245_220318, 0089_MW239_220318, 0089_MW238_220318, 0089_MW240_220318, 0089_MW243_220318, 0089_MW288_220318, 0089_MW202_220318, 0089_QC301_220318, 0089_QC401_220318	**18-Mar-2022**	**23-Mar-2022**	14-Sep-2022	✓	**23-Mar-2022**	14-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW245_220318, 0089_MW239_220318, 0089_MW238_220318, 0089_MW240_220318, 0089_MW243_220318, 0089_MW288_220318, 0089_MW202_220318, 0089_QC301_220318, 0089_QC401_220318	**18-Mar-2022**	**23-Mar-2022**	14-Sep-2022	✓	**23-Mar-2022**	14-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ☐ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**10.00**	☐	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **35276** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW373		18/03/2022 09:54 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW346		18/03/2022 10:00 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_SW372		18/03/2022 10:09 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc
004	0089_SW305		18/03/2022 10:49 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_PW304		18/03/2022 10:49 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_SW371		18/03/2022 11:06 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW368		18/03/2022 11:10 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 35276 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE: / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW373	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW346	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW372	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW305	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW304	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW371	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW368	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **35276** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SW/PW - AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW373	Clear Plastic Bottle - Natural	250 mL	00070621213204	Green	No	
001	0089_SW373	HDPE (no PTFE)	20 mL	00350621046598	Grey	No	
001	0089_SW373	HDPE (no PTFE)	20 mL	00350621046264	Grey	No	
002	0089_PW346	Clear Plastic Bottle - Natural	250 mL	00070621079239	Green	No	
002	0089_PW346	HDPE (no PTFE)	20 mL	00350821044871	Grey	No	
002	0089_PW346	HDPE (no PTFE)	20 mL	00350821044917	Grey	No	
003	0089_SW372	Clear Plastic Bottle - Natural	250 mL	00070621079248	Green	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350621046492	Grey	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350821044831	Grey	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350821044896	Grey	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350621046691	Grey	No	
004	0089_SW305	HDPE (no PTFE)	20 mL	00350621043708	Grey	No	
004	0089_SW305	HDPE (no PTFE)	20 mL	00350621043766	Grey	No	
004	0089_SW305	Clear Plastic Bottle - Natural	250 mL	00070621061596	Green	No	
005	0089_PW304	Clear Plastic Bottle - Natural	250 mL	00070621080020	Green	No	
005	0089_PW304	HDPE (no PTFE)	20 mL	00350621043715	Grey	No	
005	0089_PW304	HDPE (no PTFE)	20 mL	00350621043687	Grey	No	
006	0089_SW371	Clear Plastic Bottle - Natural	250 mL	00070621079244	Green	No	
006	0089_SW371	HDPE (no PTFE)	20 mL	00350821044889	Grey	No	
006	0089_SW371	HDPE (no PTFE)	20 mL	00350821044762	Grey	No	
007	0089_PW368	Clear Plastic Bottle - Natural	250 mL	00070621079794	Green	No	
007	0089_PW368	HDPE (no PTFE)	20 mL	00350621046424	Grey	No	
007	0089_PW368	HDPE (no PTFE)	20 mL	00350621046511	Grey	No	

Total Bottle Count: ALS: 23, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203195**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19 B)
C-O-C number	: 35276	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SW/PW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 18-Mar-2022 16:15	Issue Date	: 21-Mar-2022
Client Requested Due Date	: 29-Mar-2022	Scheduled Reporting Date	: **29-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 9.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2203195-001	18-Mar-2022 09:54	0089_SW373_220318	✓	✓	✓	✓
EP2203195-002	18-Mar-2022 10:00	0089_PW346_220318	✓	✓	✓	✓
EP2203195-003	18-Mar-2022 10:09	0089_SW372_220318	✓	✓	✓	✓
EP2203195-004	18-Mar-2022 10:49	0089_SW305_220318	✓	✓	✓	✓
EP2203195-005	18-Mar-2022 10:49	0089_PW304_220318	✓	✓	✓	✓
EP2203195-006	18-Mar-2022 11:06	0089_SW371_220318	✓	✓	✓	✓
EP2203195-007	18-Mar-2022 11:10	0089_PW368_220318	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203195**	Page	: 1 of 9
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022 16:15
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35276	Issue Date	: 29-Mar-2022 12:37
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW346_220318	0089_PW304_220318	0089_PW368_220318	----	----
				Sampling date / time	18-Mar-2022 10:00	18-Mar-2022 10:49	18-Mar-2022 11:10	----	----
Compound	CAS Number	LOR	Unit		EP2203195-002	EP2203195-005	EP2203195-007	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**1080**	**245**	**158**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**1080**	**245**	**158**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**875**	**1770**	**2740**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**9480**	**12900**	**19400**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**302**	**339**	**471**	----	----
Magnesium	7439-95-4	1	mg/L		**724**	**1000**	**1440**	----	----
Sodium	7440-23-5	1	mg/L		**5390**	**7510**	**11100**	----	----
Potassium	7440-09-7	1	mg/L		**327**	**463**	**547**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**307**	**406**	**607**	----	----
ø Total Cations	----	0.01	meq/L		**317**	**438**	**639**	----	----
ø Ionic Balance	----	0.01	%		**1.64**	**3.80**	**2.52**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.04**	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.06**	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.64**	**0.02**	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.12**	**0.02**	**0.05**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.08**	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW346_220318	0089_PW304_220318	0089_PW368_220318	----	----
				Sampling date / time	18-Mar-2022 10:00	18-Mar-2022 10:49	18-Mar-2022 11:10	----	----
Compound	CAS Number	LOR	Unit		EP2203195-002	EP2203195-005	EP2203195-007	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW346_220318	0089_PW304_220318	0089_PW368_220318	----	----
				Sampling date / time	18-Mar-2022 10:00	18-Mar-2022 10:49	18-Mar-2022 11:10	----	----
Compound	CAS Number	LOR	Unit		EP2203195-002	EP2203195-005	EP2203195-007	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.94**	**0.04**	**0.05**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.76**	**0.04**	**0.05**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.88**	**0.04**	**0.05**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.4**	**94.5**	**93.7**	----	----
13C8-PFOA	----	0.02	%		**101**	**101**	**101**	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_220318	0089_SW372_220318	0089_SW305_220318	0089_SW371_220318	----
				Sampling date / time	18-Mar-2022 09:54	18-Mar-2022 10:09	18-Mar-2022 10:49	18-Mar-2022 11:06	----
Compound	CAS Number	LOR	Unit		EP2203195-001	EP2203195-003	EP2203195-004	EP2203195-006	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		126	127	130	128	----
Total Alkalinity as CaCO3	----	1	mg/L		126	127	130	128	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2800	2700	2700	2710	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18900	19500	19300	19100	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		420	474	466	462	----
Magnesium	7439-95-4	1	mg/L		1310	1470	1440	1440	----
Sodium	7440-23-5	1	mg/L		9960	11300	11100	11100	----
Potassium	7440-09-7	1	mg/L		495	550	541	544	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		594	609	603	598	----
ø Total Cations	----	0.01	meq/L		575	650	638	638	----
ø Ionic Balance	----	0.01	%		1.65	3.29	2.83	3.28	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.10	0.04	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_220318	0089_SW372_220318	0089_SW305_220318	0089_SW371_220318	----
				Sampling date / time	18-Mar-2022 09:54	18-Mar-2022 10:09	18-Mar-2022 10:49	18-Mar-2022 11:06	----
Compound	CAS Number	LOR	Unit		EP2203195-001	EP2203195-003	EP2203195-004	EP2203195-006	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_220318	0089_SW372_220318	0089_SW305_220318	0089_SW371_220318	----
				Sampling date / time	18-Mar-2022 09:54	18-Mar-2022 10:09	18-Mar-2022 10:49	18-Mar-2022 11:06	----
Compound	CAS Number	LOR	Unit		EP2203195-001	EP2203195-003	EP2203195-004	EP2203195-006	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.12**	**0.05**	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.12**	**0.05**	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.12**	**0.05**	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.1**	**99.9**	**105**	**94.6**	----
13C8-PFOA	----	0.02	%		**101**	**104**	**95.9**	**99.7**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203195**	Page	: 1 of 6
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 22-Mar-2022
C-O-C number	: 35276	Issue Date	: 29-Mar-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SW/PW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4247622)									
EP2203138-014	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	445	451	1.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	445	451	1.2	0% - 20%
EP2203194-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	264	265	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	264	265	0.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4240557)									
EP2203194-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	77	78	2.1	0% - 20%
EP2203195-006	0089_SW371_220318	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2710	2680	1.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4240556)									
EP2203194-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	38	39	0.0	0% - 20%
EP2203195-006	0089_SW371_220318	ED045G: Chloride	16887-00-6	1	mg/L	19100	19100	0.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4241856)									
EP2203194-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	118	119	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	28	28	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
EP2203195-004	0089_SW305_220318	ED093F: Calcium	7440-70-2	1	mg/L	466	475	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1440	1480	2.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11100	11400	2.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	541	556	2.7	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4245964)									
EP2203195-003	0089_SW372_220318	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.01	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.04	0.05	30.3	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4245964)									
EP2203195-003	0089_SW372_220318	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4245964)									
EP2203195-003	0089_SW372_220318	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4245964)									
EP2203195-003	0089_SW372_220318	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4245964) - continued									
EP2203195-003	0089_SW372_220318	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4245964)									
EP2203195-003	0089_SW372_220318	EP231X: Sum of PFAS	----	0.01	µg/L	0.05	0.07	33.3	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4247622)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	109	81.2	126
				<1	200 mg/L	101	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240557)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.5	87.7	113
				<1	500 mg/L	103	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4240556)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.9	87.9	114
				<1	1000 mg/L	106	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4241856)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.5	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	93.8	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.4	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4245964)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	84.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	83.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	74.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	85.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	88.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4245964)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	98.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4245964) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4245964)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	79.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	79.3	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	86.0	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	112	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	94.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4245964)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	86.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	127	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	129	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	111	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4240557)							
EP2203194-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	105	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4240556)							
EP2203194-003	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	103	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203195**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022
Site	: DEF19009/Stirling SW/PW - AG	Issue Date	: 29-Mar-2022
Sampler	: [redacted]	No. of samples received	: 7
Order number	: DEF19009/730	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW373_220318, 0089_PW346_220318, 0089_SW372_220318, 0089_SW305_220318, 0089_PW304_220318, 0089_SW371_220318, 0089_PW368_220318	**18-Mar-2022**	**----**	----	----	**24-Mar-2022**	01-Apr-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW373_220318, 0089_PW346_220318, 0089_SW372_220318, 0089_SW305_220318, 0089_PW304_220318, 0089_SW371_220318, 0089_PW368_220318	**18-Mar-2022**	**----**	----	----	**29-Mar-2022**	15-Apr-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW373_220318, 0089_PW346_220318, 0089_SW372_220318, 0089_SW305_220318, 0089_PW304_220318, 0089_SW371_220318, 0089_PW368_220318	**18-Mar-2022**	**----**	----	----	**29-Mar-2022**	15-Apr-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW373_220318, 0089_PW346_220318, 0089_SW372_220318, 0089_SW305_220318, 0089_PW304_220318, 0089_SW371_220318, 0089_PW368_220318	**18-Mar-2022**	**----**	----	----	**22-Mar-2022**	25-Mar-2022	✓

Matrix: **WATER**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW373_220318, 0089_PW346_220318, 0089_SW372_220318, 0089_SW305_220318, 0089_PW304_220318, 0089_SW371_220318, 0089_PW368_220318	**18-Mar-2022**	**24-Mar-2022**	14-Sep-2022	✓	**24-Mar-2022**	14-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW373_220318, 0089_PW346_220318, 0089_SW372_220318, 0089_SW305_220318, 0089_PW304_220318, 0089_SW371_220318, 0089_PW368_220318	**18-Mar-2022**	**24-Mar-2022**	14-Sep-2022	✓	**24-Mar-2022**	14-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW373_220318, 0089_PW346_220318, 0089_SW372_220318, 0089_SW305_220318, 0089_PW304_220318, 0089_SW371_220318, 0089_PW368_220318	**18-Mar-2022**	**24-Mar-2022**	14-Sep-2022	✓	**24-Mar-2022**	14-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW373_220318, 0089_PW346_220318, 0089_SW372_220318, 0089_SW305_220318, 0089_PW304_220318, 0089_SW371_220318, 0089_PW368_220318	**18-Mar-2022**	**24-Mar-2022**	14-Sep-2022	✓	**24-Mar-2022**	14-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW373_220318, 0089_PW346_220318, 0089_SW372_220318, 0089_SW305_220318, 0089_PW304_220318, 0089_SW371_220318, 0089_PW368_220318	**18-Mar-2022**	**24-Mar-2022**	14-Sep-2022	✓	**24-Mar-2022**	14-Sep-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	10	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) *COC#:* **35277** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD346		18/03/2022 10:01 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
002	0089_SD304		18/03/2022 10:55 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		
003	0089_SD368		18/03/2022 11:13 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY

COC#: **35277** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19

SAMPLER MOBILE:
/ ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SD346	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0089_SD304	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0089_SD368	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **35277** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: DEF19009/Stirling SED AG

ORDER NO: DEF19009/730

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 / ES2019CARBSD0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD346	HDPE Soil Jar	200 mL	00621019099183	Grey	No	
002	0089_SD304	HDPE Soil Jar	200 mL	00621019099164	Grey	No	
003	0089_SD368	HDPE Soil Jar	200 mL	00621019099229	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2203196**

Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: DEF19009/730	Quote number	: ES2019CARBSD0002 (SY/139/19 B)
C-O-C number	: 35277	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: DEF19009/Stirling SED AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 18-Mar-2022 16:15	Issue Date	: 21-Mar-2022
Client Requested Due Date	: 29-Mar-2022	Scheduled Reporting Date	: **29-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 9.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2203196-001	18-Mar-2022 10:01	0089_SD346_220318	✓	✓
EP2203196-002	18-Mar-2022 10:55	0089_SD304_220318	✓	✓
EP2203196-003	18-Mar-2022 11:13	0089_SD368_220318	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2203196**	Page	: 1 of 5
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022 16:15
Order number	: DEF19009/730	Date Analysis Commenced	: 28-Mar-2022
C-O-C number	: 35277	Issue Date	: 29-Mar-2022 10:20
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD346_220318	0089_SD304_220318	0089_SD368_220318	----	----
			Sampling date / time	18-Mar-2022 10:01	18-Mar-2022 10:55	18-Mar-2022 11:13	----	----
Compound	CAS Number	LOR	Unit	EP2203196-001	EP2203196-002	EP2203196-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**67.7**	**33.2**	**30.9**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0024**	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0153**	<0.0002	<0.0002	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0002**	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD346_220318	0089_SD304_220318	0089_SD368_220318	----	----
				Sampling date / time	18-Mar-2022 10:01	18-Mar-2022 10:55	18-Mar-2022 11:13	----	----
Compound	CAS Number	LOR	Unit		EP2203196-001	EP2203196-002	EP2203196-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0179**	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0177**	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0179**	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**88.0**	**87.0**	**90.5**	----	----
13C8-PFOA	----	0.0002	%		**85.0**	**88.5**	**102**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2203196**	Page	: 1 of 7
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: 11 HARVEST TERRACE PO BOX 155 WEST PERTH WA, AUSTRALIA 6006	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022
Order number	: DEF19009/730	Date Analysis Commenced	: 28-Mar-2022
C-O-C number	: 35277	Issue Date	: 29-Mar-2022
Sampler	: [redacted] [redacted]		
Site	: DEF19009/Stirling SED AG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4252300)									
EP2203059-003	Anonymous	EA055: Moisture Content	----	0.1	%	6.0	6.7	12.2	0% - 20%
EP2203059-014	Anonymous	EA055: Moisture Content	----	0.1	%	20.5	21.2	3.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4251496)									
EP2203059-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2203339-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4251496)									
EP2203059-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4251496) - continued									
EP2203059-005	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2203339-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4251496)									
EP2203059-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2203339-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4251496)									
EP2203059-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2203339-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4251496)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	71.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4251496)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	77.7	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	72.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4251496)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.2	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	72.8	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.7	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	67.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4251496)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	91.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	68.0	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4251496) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	70.8	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4251496)							
EP2203059-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	105	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	76.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	77.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	81.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	87.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	84.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4251496)							
EP2203059-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	110	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	89.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	117	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	89.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	97.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	94.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	91.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	79.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	90.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	113	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	86.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4251496)							
EP2203059-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	88.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	90.5	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	86.2	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	88.5	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	115	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	86.0	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4251496) - continued							
EP2203059-005	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	75.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4251496)							
EP2203059-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	93.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	68.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	72.0	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2203196**	Page	: 1 of 4
Client	: **CARDNO (WA) PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 18-Mar-2022
Site	: DEF19009/Stirling SED AG	Issue Date	: 29-Mar-2022
Sampler	: [redacted]	No. of samples received	: 3
Order number	: DEF19009/730	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ▯ = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD346_220318, 0089_SD304_220318, 0089_SD368_220318	**18-Mar-2022**	**----**	----	----	**28-Mar-2022**	01-Apr-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD346_220318, 0089_SD304_220318, 0089_SD368_220318	**18-Mar-2022**	**28-Mar-2022**	14-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD346_220318, 0089_SD304_220318, 0089_SD368_220318	**18-Mar-2022**	**28-Mar-2022**	14-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD346_220318, 0089_SD304_220318, 0089_SD368_220318	**18-Mar-2022**	**28-Mar-2022**	14-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD346_220318, 0089_SD304_220318, 0089_SD368_220318	**18-Mar-2022**	**28-Mar-2022**	14-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD346_220318, 0089_SD304_220318, 0089_SD368_220318	**18-Mar-2022**	**28-Mar-2022**	14-Sep-2022	✓	**28-Mar-2022**	07-May-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ▯ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

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Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Cardno (WA) Pty Ltd	**Contact Name :** [redacted]	**Purchase Order :** DEF19009/730	**COC Number :** DEF19009/730 -01
Office Address : 11 Harvest Terrace, West perth, WA, 6005		**PROJECT Number :** WA_0089_PFASOMP	**Eurofins | mgt quote ID :**
	Email for COC/SRN/Results : [redacted]	**PROJECT Name :** DEF19009/Stirling	**Data output format:** PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to [redacted] with the project No in the header file

Please send invoice to
[redacted]

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC211_220315	15/03/2022	Water	X
2	0089_QC212_220315	15/03/2022	Soil	X
3	0089_QC213_220315	15/03/2022	Water	X
4	0089_QC214_220315	15/03/2022	Water	X
5	0089_QC215_220315	15/03/2022	Soil	X
6	0089_QC216_220315	15/03/2022	Water	X
7	0089_QC217_220315	15/03/2022	Water	X
8	0089_QC218_220315	15/03/2022	Water	X
9				
10				
11				
12				

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous Iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	

Sample comments:

Relinquished By:
Maelle Bourdais

Date & Time : 15/03/2022

Signature:

Laboratory Staff
[redacted]
Date & Time : 18/3/22 9:00
Signature: [redacted]

Turn around time
1 DAY ☐ 2 DAY ☐ 3 DAY ☐
STANDARD ☑ Other:

Method Of Shipment
☑ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number: 872903

Date/Time: 18/3/22 9:00
Temp / No
14.7 6
8.1
13.4
-0.3
Final Temp: 11.7

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Rolleston, Christchurch 7675
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IANZ # 1290

Sample Receipt Advice

Company name:	Cardno (WA)
Contact name:	[redacted]
Project name:	DEF19009/Stirling
Project ID:	WA_0089_PFASOMP
Turnaround time:	5 Day
Date/Time received	Mar 21, 2022 4:38 PM
Eurofins reference	872903

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 11.7 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]

Results will be delivered electronically via email to [redacted] - [redacted]

Note: A copy of these results will also be delivered to the general Cardno (WA) email address.

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Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730 -01
Report #: 872903
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Mar 21, 2022 4:38 PM
Due: Mar 28, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC211_220315	Mar 15, 2022		Water	L22-Ma41592		X
2	0089_QC212_220315	Mar 15, 2022		Soil	L22-Ma41593	X	X
3	0089_QC213_220315	Mar 15, 2022		Water	L22-Ma41594		X
4	0089_QC214_220315	Mar 15, 2022		Water	L22-Ma41595		X
5	0089_QC215_220315	Mar 15, 2022		Soil	L22-Ma41596	X	X
6	0089_QC216_	Mar 15, 2022		Water	L22-Ma41597		X

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email: EnviroSales@eurofins.com

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IANZ # 1290

Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730 -01
Report #: 872903
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Mar 21, 2022 4:38 PM
Due: Mar 28, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	220315						
7	0089_QC217_220315	Mar 15, 2022		Water	L22-Ma41598		X
8	0089_QC218_220315	Mar 15, 2022		Water	L22-Ma41599		X
Test Counts						2	8

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Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Cardno (WA) Pty Ltd	**Contact Name :** [redacted]	**Purchase Order :** DEF19009/730	**COC Number :** DEF19009/730 -01
Office Address : 11 Harvest Terrace, West perth, WA, 6005		**PROJECT Number :** WA_0089_PFASOMP	**Eurofins | mgt quote ID :**
	Email for COC/SRN/Results : [redacted]	**PROJECT Name :** DEF19009/Stirling	**Data output format:** PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to [redacted] with the project No in the header file

Please send invoice to [redacted]

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC201_220314	14/03/2022	Water	X
2	0089_QC202_220314	14/03/2022	Water	X
3	0089_QC203_220314	14/03/2022	Water	X
4	0089_QC204_220314	14/03/2022	Water	X
5	0089_QC205_220314	14/03/2022	Water	X
6	0089_QC206_220314	14/03/2022	Water	X
7	0089_QC207_220314	14/03/2022	Water	X
8	0089_QC208_220314	14/03/2022	Water	X
9	0089_QC209_220314	14/03/2022	Soil	X
10	0089_QC210_220314	14/03/2022	Soil	X
11				
12				

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous Iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	

Sample comments:

Laboratory Staff

Relinquished By: Maelle Bourdais
Date & Time : 14/03/2022
Signature:

Received By: [redacted]
Date & Time : 18/3/22 9:00
Signature: [redacted]

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number:

Date/Time: 18/3/22 9 00
Chilled: Yes / No
14.7
8.1
13.4
-8.3
11.7

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IANZ # 1290

Sample Receipt Advice

Company name:	Cardno (WA)
Contact name:	[redacted]
Project name:	DEF19009/Stirling
Project ID:	WA_0089_PFASOMP
Turnaround time:	5 Day
Date/Time received	Mar 18, 2022 9:00 AM
Eurofins reference	872911

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 11.7 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]

Results will be delivered electronically via email to [redacted] - [redacted]

Note: A copy of these results will also be delivered to the general Cardno (WA) email address.

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IANZ # 1290

Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730 -01
Report #: 872911
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Mar 18, 2022 9:00 AM
Due: Mar 25, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	40089_QC201_220315	Mar 14, 2022		Water	L22-Ma41637			X
2	40089_QC202_220315	Mar 14, 2022		Soil	L22-Ma41638		X	X
3	40089_QC203_220315	Mar 14, 2022		Water	L22-Ma41639			X
4	40089_QC204_220315	Mar 14, 2022		Water	L22-Ma41640			X
5	40089_QC205_220315	Mar 14, 2022		Soil	L22-Ma41641		X	X
6	40089_QC206	Mar 14, 2022		Water	L22-Ma41642			X

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Company Name: Cardno (WA)
Address: 11 Harvest Terrace
West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730 -01
Report #: 872911
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Mar 18, 2022 9:00 AM
Due: Mar 25, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
	_220315							
7	40089_QC207_220315	Mar 14, 2022		Water	L22-Ma41643			X
8	40089_QC208_220315	Mar 14, 2022		Water	L22-Ma41644			X
9	40089_QC209_220315	Mar 14, 2022		Soil	L22-Ma41645	X		X
10	40089_QC210_220315	Mar 14, 2022		Soil	L22-Ma41646	X		X
Test Counts						4	4	10

Cardno Consulting WA
11 Harvest Terrace
West Perth
WA 6005

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **872911-S-V2**
Project name DEF19009/Stirling
Project ID WA_0089_PFASOMP
Received Date Mar 18, 2022

Client Sample ID			**0089_QC209_220314**	**0089_QC210_220314**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L22-Ma41645**	**L22-Ma41646**
Date Sampled			**Mar 14, 2022**	**Mar 14, 2022**
Test/Reference	LOR	Unit		
% Moisture	1	%	30	34
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	52	52
13C5-PFPeA (surr.)	1	%	68	72
13C5-PFHxA (surr.)	1	%	78	84
13C4-PFHpA (surr.)	1	%	80	81
13C8-PFOA (surr.)	1	%	71	96
13C5-PFNA (surr.)	1	%	87	110
13C6-PFDA (surr.)	1	%	122	129
13C2-PFUnDA (surr.)	1	%	114	113
13C2-PFDoDA (surr.)	1	%	93	129
13C2-PFTeDA (surr.)	1	%	72	71
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10

Client Sample ID			0089_QC209_220314	0089_QC210_220314
Sample Matrix			Soil	Soil
Eurofins Sample No.			L22-Ma41645	L22-Ma41646
Date Sampled			Mar 14, 2022	Mar 14, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
13C8-FOSA (surr.)	1	%	112	108
D3-N-MeFOSA (surr.)	1	%	89	102
D5-N-EtFOSA (surr.)	1	%	102	114
D7-N-MeFOSE (surr.)	1	%	91	92
D9-N-EtFOSE (surr.)	1	%	98	101
D5-N-EtFOSAA (surr.)	1	%	83	58
D3-N-MeFOSAA (surr.)	1	%	102	78
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	96	107
18O2-PFHxS (surr.)	1	%	92	113
13C8-PFOS (surr.)	1	%	78	93
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	43	45
13C2-6:2 FTSA (surr.)	1	%	52	INT
13C2-8:2 FTSA (surr.)	1	%	86	125
13C2-10:2 FTSA (surr.)	1	%	105	127
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Brisbane	Mar 21, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Mar 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Mar 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Mar 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Mar 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730 -01
Report #: 872911
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Mar 18, 2022 9:00 AM
Due: Mar 25, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	40089_QC201_220315	Mar 14, 2022		Water	L22-Ma41637		X
2	40089_QC202_220315	Mar 14, 2022		Water	L22-Ma41638		X
3	40089_QC203_220315	Mar 14, 2022		Water	L22-Ma41639		X
4	40089_QC204_220315	Mar 14, 2022		Water	L22-Ma41640		X
5	40089_QC205_220315	Mar 14, 2022		Water	L22-Ma41641		X
6	40089_QC206	Mar 14, 2022		Water	L22-Ma41642		X

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Received: Mar 18, 2022 9:00 AM
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Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	_220315						
7	40089_QC207_220315	Mar 14, 2022		Water	L22-Ma41643		X
8	40089_QC208_220315	Mar 14, 2022		Water	L22-Ma41644		X
9	40089_QC209_220315	Mar 14, 2022		Soil	L22-Ma41645	X	X
10	40089_QC210_220315	Mar 14, 2022		Soil	L22-Ma41646	X	X
Test Counts						2	10

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	86			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	105			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	79			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	93			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	85			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	72			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	84			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	103			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	87			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	149			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	96			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	97			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	99			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	101			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	110			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	101			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	69			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	87			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	85			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	80			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	76			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	88			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	93			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	98			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	79			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	82			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	80			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	74			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	S22-Ma53178	NCP	%	88			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S22-Ma53178	NCP	%	93			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S22-Ma53178	NCP	%	87			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-Ma53178	NCP	%	98			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S22-Ma53178	NCP	%	91			50-150	Pass	
Perfluorononanoic acid (PFNA)	S22-Ma53178	NCP	%	90			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S22-Ma53178	NCP	%	91			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-Ma53178	NCP	%	109			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-Ma53178	NCP	%	97			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-Ma53178	NCP	%	124			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-Ma53178	NCP	%	91			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	S22-Ma53178	NCP	%	86			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-Ma53178	NCP	%	105			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-Ma53178	NCP	%	105			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S22-Ma53178	NCP	%	95			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S22-Ma53178	NCP	%	111			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-Ma53178	NCP	%	81			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-Ma53178	NCP	%	76			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S22-Ma53178	NCP	%	89			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-Ma53178	NCP	%	106			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-Ma53178	NCP	%	85			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-Ma53178	NCP	%	89			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Ma53178	NCP	%	113			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-Ma53178	NCP	%	124			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Ma53178	NCP	%	110			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-Ma53178	NCP	%	102			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-Ma53178	NCP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S22-Ma53178	NCP	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-Ma53178	NCP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-Ma53178	NCP	%	82			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L22-Ma41645	CP	%	30	29	5.0	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-Ma52328	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-Ma52328	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S22-Ma52328	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-Ma52328	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst (NSW)
[redacted] Senior Analyst (NSW)

[redacted]

[redacted]

Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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West Perth
WA 6005

NATA Accredited
Accreditation Number 2377
Site Number 2370

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Attention: [redacted]

Report **872911-W-V2**
Project name DEF19009/Stirling
Project ID WA_0089_PFASOMP
Received Date Mar 18, 2022

Client Sample ID			**0089_QC201_220314**	**0089_QC202_220314**	**0089_QC203_220314**	**0089_QC204_220314**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-Ma41637**	**L22-Ma41638**	**L22-Ma41639**	**L22-Ma41640**
Date Sampled			**Mar 14, 2022**	**Mar 14, 2022**	**Mar 14, 2022**	**Mar 14, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.03	0.02
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.15	[N09]0.10
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.37
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	103	102	96	109
13C5-PFPeA (surr.)	1	%	136	119	124	116
13C5-PFHxA (surr.)	1	%	131	138	129	121
13C4-PFHpA (surr.)	1	%	124	118	129	119
13C8-PFOA (surr.)	1	%	124	131	114	102
13C5-PFNA (surr.)	1	%	120	137	121	133
13C6-PFDA (surr.)	1	%	83	103	81	84
13C2-PFUnDA (surr.)	1	%	74	94	72	103
13C2-PFDoDA (surr.)	1	%	71	84	63	84
13C2-PFTeDA (surr.)	1	%	82	63	51	60
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	90	115	106	118
D3-N-MeFOSA (surr.)	1	%	59	72	65	61

Client Sample ID			0089_QC201_220314	0089_QC202_220314	0089_QC203_220314	0089_QC204_220314
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Ma41637	L22-Ma41638	L22-Ma41639	L22-Ma41640
Date Sampled			Mar 14, 2022	Mar 14, 2022	Mar 14, 2022	Mar 14, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	42	49	43	47
D7-N-MeFOSE (surr.)	1	%	34	52	39	45
D9-N-EtFOSE (surr.)	1	%	32	47	35	43
D5-N-EtFOSAA (surr.)	1	%	68	91	67	89
D3-N-MeFOSAA (surr.)	1	%	85	107	81	105
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	0.14	0.02
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	0.05	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	[N09]0.14	[N09]0.04
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.66	[N09]3.2
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.63
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	[N09]0.03	< 0.01	[N09]3.3
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	127	133	134	137
18O2-PFHxS (surr.)	1	%	121	135	108	100
13C8-PFOS (surr.)	1	%	96	121	102	97
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	159	100	157	130
13C2-6:2 FTSA (surr.)	1	%	123	119	149	166
13C2-8:2 FTSA (surr.)	1	%	99	103	96	146
13C2-10:2 FTSA (surr.)	1	%	105	110	82	112
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	0.03	0.66	6.5
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.03	< 0.01	3.67
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	0.03	0.66	6.87
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	0.98	7.02
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	1.17	7.69

Client Sample ID			0089_QC205_220314	0089_QC206_220314	0089_QC207_220314	0089_QC208_220314
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Ma41641	L22-Ma41642	L22-Ma41643	L22-Ma41644
Date Sampled			Mar 14, 2022	Mar 14, 2022	Mar 14, 2022	Mar 14, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.10	0.12	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.24	0.12	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	[N09]1.1	[N09]0.86	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	0.41	[N09]0.08	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]1.3	[N09]0.30	< 0.01	< 0.01

Client Sample ID			0089_QC205_220314	0089_QC206_220314	0089_QC207_220314	0089_QC208_220314
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Ma41641	L22-Ma41642	L22-Ma41643	L22-Ma41644
Date Sampled			Mar 14, 2022	Mar 14, 2022	Mar 14, 2022	Mar 14, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	[N09]0.05	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	98	84	94	117
13C5-PFPeA (surr.)	1	%	83	90	113	139
13C5-PFHxA (surr.)	1	%	73	88	126	123
13C4-PFHpA (surr.)	1	%	91	102	115	120
13C8-PFOA (surr.)	1	%	67	74	117	139
13C5-PFNA (surr.)	1	%	108	111	115	137
13C6-PFDA (surr.)	1	%	133	79	95	107
13C2-PFUnDA (surr.)	1	%	123	92	96	93
13C2-PFDoDA (surr.)	1	%	104	87	112	83
13C2-PFTeDA (surr.)	1	%	62	86	98	72
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	[N09]0.33	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	104	97	97	121
D3-N-MeFOSA (surr.)	1	%	63	83	82	77
D5-N-EtFOSA (surr.)	1	%	60	61	82	60
D7-N-MeFOSE (surr.)	1	%	32	50	65	43
D9-N-EtFOSE (surr.)	1	%	30	49	72	48
D5-N-EtFOSAA (surr.)	1	%	189	82	94	84
D3-N-MeFOSAA (surr.)	1	%	INT	105	105	100
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.09	0.18	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	[N09]0.11	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.02	0.03	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.23	[N09]0.42	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]9.7	[N09]5.5	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]1.2	[N09]0.24	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]50	[N09]3.1	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	111	112	108	135
18O2-PFHxS (surr.)	1	%	113	104	124	121
13C8-PFOS (surr.)	1	%	76	97	97	116

Client Sample ID			0089_QC205_220314	0089_QC206_220314	0089_QC207_220314	0089_QC208_220314
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-Ma41641**	**L22-Ma41642**	**L22-Ma41643**	**L22-Ma41644**
Date Sampled			**Mar 14, 2022**	**Mar 14, 2022**	**Mar 14, 2022**	**Mar 14, 2022**
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	0.14	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	129	104	105	104
13C2-6:2 FTSA (surr.)	1	%	44	120	113	131
13C2-8:2 FTSA (surr.)	1	%	49	110	105	116
13C2-10:2 FTSA (surr.)	1	%	INT	132	163	127
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	59.7	8.6	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	51.3	3.4	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	61	8.9	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	63.08	10.26	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	65.02	10.95	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Mar 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Mar 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Mar 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Mar 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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West Perth
WA 6005

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: DEF19009/730 -01
Report #: 872911
Phone: 08 9273 3888
Fax: 08 9388 3831

Received: Mar 18, 2022 9:00 AM
Due: Mar 25, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	40089_QC201_220315	Mar 14, 2022		Water	L22-Ma41637		X
2	40089_QC202_220315	Mar 14, 2022		Water	L22-Ma41638		X
3	40089_QC203_220315	Mar 14, 2022		Water	L22-Ma41639		X
4	40089_QC204_220315	Mar 14, 2022		Water	L22-Ma41640		X
5	40089_QC205_220315	Mar 14, 2022		Water	L22-Ma41641		X
6	40089_QC206	Mar 14, 2022		Water	L22-Ma41642		X

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Received: Mar 18, 2022 9:00 AM
Due: Mar 25, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370							
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	_220315						
7	40089_QC207_220315	Mar 14, 2022		Water	L22-Ma41643		X
8	40089_QC208_220315	Mar 14, 2022		Water	L22-Ma41644		X
9	40089_QC209_220315	Mar 14, 2022		Soil	L22-Ma41645	X	X
10	40089_QC210_220315	Mar 14, 2022		Soil	L22-Ma41646	X	X
Test Counts						2	10

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	77			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	75			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	75			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	80			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	99			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	77			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	79			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	91			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	82			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	73			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	71			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	86			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	71			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	67			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	90			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	75			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	82			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	87			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	81			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	92			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	84			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	80			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	76			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	81			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	57			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	86			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	75			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L22-Ma41638	CP	%	74			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ma41638	CP	%	69			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ma41638	CP	%	81			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ma41638	CP	%	77			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ma41638	CP	%	85			50-150	Pass	
Perfluorononanoic acid (PFNA)	L22-Ma41638	CP	%	66			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ma41638	CP	%	82			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ma41638	CP	%	90			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ma41638	CP	%	86			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ma41638	CP	%	64			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ma41638	CP	%	81			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L22-Ma41638	CP	%	80			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ma41638	CP	%	77			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ma41638	CP	%	82			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ma41638	CP	%	91			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ma41638	CP	%	79			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ma41638	CP	%	85			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ma41638	CP	%	81			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L22-Ma41638	CP	%	77			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ma41638	CP	%	82			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ma41638	CP	%	74			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ma41638	CP	%	76			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ma41638	CP	%	74			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ma41638	CP	%	80			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ma41638	CP	%	95			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ma41638	CP	%	52			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ma41638	CP	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ma41638	CP	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ma41638	CP	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ma41638	CP	%	81			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ma41637	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ma41637	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ma41637	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ma41637	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ma41637	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ma41637	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ma41637	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ma41637	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ma41637	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ma41637	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ma41641	CP	ug/L	0.10	0.10	1.0	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ma41641	CP	ug/L	0.24	0.24	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ma41641	CP	ug/L	1.1	1.1	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ma41641	CP	ug/L	0.41	0.43	5.0	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ma41641	CP	ug/L	1.3	1.4	2.0	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ma41641	CP	ug/L	0.05	0.06	5.0	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ma41641	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ma41641	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ma41641	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ma41641	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ma41641	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ma41641	CP	ug/L	0.33	0.36	8.0	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ma41641	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ma41641	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ma41641	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ma41641	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ma41641	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ma41641	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ma41641	CP	ug/L	0.09	0.10	2.0	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ma41641	CP	ug/L	0.11	0.13	21	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ma41641	CP	ug/L	0.02	0.02	1.0	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ma41641	CP	ug/L	0.23	0.22	6.0	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ma41641	CP	ug/L	9.7	9.7	1.0	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ma41641	CP	ug/L	1.2	1.2	4.0	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ma41641	CP	ug/L	50	58	16	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ma41641	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ma41641	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ma41641	CP	ug/L	0.14	0.14	4.0	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ma41641	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ma41641	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Ma41642	CP	ug/L	0.12	0.12	4.0	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Ma41642	CP	ug/L	0.12	0.13	6.0	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Ma41642	CP	ug/L	0.86	0.84	2.0	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Ma41642	CP	ug/L	0.08	0.09	7.0	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Ma41642	CP	ug/L	0.30	0.34	12	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-Ma41642	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-Ma41642	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-Ma41642	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	L22-Ma41642	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	L22-Ma41642	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-Ma41642	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-Ma41642	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-Ma41642	CP	ug/L	0.18	0.18	4.0	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-Ma41642	CP	ug/L	0.03	0.03	9.0	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-Ma41642	CP	ug/L	0.42	0.42	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-Ma41642	CP	ug/L	5.5	6.0	8.0	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-Ma41642	CP	ug/L	0.24	0.28	16	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-Ma41642	CP	ug/L	3.1	3.2	2.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	L22-Ma41642	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-Ma41642	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst (NSW)

[redacted]
[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Monitoring Date	Monitoring Location	Sample ID	Screen Interval (mbgl)	TOC (mAHD)	Well Depth (mbgl)	SWL Time	SWL (mbTOC)	RWL (mAHD)	Observations
17/03/2022	MW010	0089_MW010_220317	NA	4.859	9.2	11:17:00	4.57	0.289	
14/03/2022	MW109	0089_MW109_220314	2.5-5.5_	4.446	5.5	10:01:00	4.02	0.426	
14/03/2022	MW112	0089_MW112_220314	3.0 - 6.0	3.973	6	9:47:00	3.39	0.583	
14/03/2022	MW120	0089_MW120_220314	2.5-5.5_	4.409	5.5	9:33:00	3.946	0.463	
14/03/2022	MW121	0089_MW121_220314	2.7-5.7_	3.7	5.7	9:00:00	3.25	0.45	Hydrasleeve didn't fill up during recovery
14/03/2022	MW123	0089_MW123_220314	4.5-8_	6.62	8	8:12:00	6.23	0.39	
14/03/2022	MW124	0089_MW124_220314	0.75-4_	1.899	4	7:57:00	1.71	0.189	
14/03/2022	MW125	0089_MW125_220314	0.9-3.9_	1.882	3.9	9:06:00	1.685	0.197	
14/03/2022	MW126	0089_MW126_220314	0.9-3.9_	1.948	3.9	9:52:00	1.74	0.208	
14/03/2022	MW127	0089_MW127_220314	0.9-3.9_	1.771	3.9	10:40:00	1.71	0.061	
14/03/2022	MW128		2.5-5.5_	4.537	5.5	10:19:00			Dry at 3.8mbgl
15/03/2022	MW137								Not found
15/03/2022	MW139	0089_MW139_220315	2-5_	2.273	5	15:09:00	2.004	0.269	
15/03/2022	MW141	0089_MW141_220315	2-5_	3.025	5	14:39:00	2.726	0.299	
15/03/2022	MW142	0089_MW142_220315	0.25-4_	2.573	4	14:21:00	2.275	0.298	
15/03/2022	MW147		2-5_	3.423	5.2	16:53:00			Dry bore
15/03/2022	MW149	0089_MW149_220315	1-4_	2.303	4	14:34:00	2.026	0.277	
15/03/2022	MW158	0089_MW158_220315	NA	14.541	15.82	10:22:00	14.082	0.459	Hydrasleeve didn't fill up during recovery
15/03/2022	MW161	0089_MW161_220315	NA	17.225	18.13	12:08:00	16.616	0.609	Bore labelled MB42
15/03/2022	MW166	0089_MW166_220315	10-13_	11.89	13	12:15:00	11.202	0.688	
15/03/2022	MW171	0089_MW171_220315	28.5-31.5_	29.238	31.5	11:11:00	28.451	0.787	
15/03/2022	MW172		NA	16.772	26	12:17:00			Dry bore, bailer left in bore
15/03/2022	MW173	0089_MW173_220315	NA	10.08	11.11	9:14:00	9.53	0.55	B05
15/03/2022	MW193	0089_MW193_220315	10.5-13.5_	11.86	13.5	9:29:00	11.205	0.655	
15/03/2022	MW195D	0089_MW195D_220315	10-13_	4.363	13	8:54:00	4.129	0.234	
15/03/2022	MW195S	0089_MW195S_220315	3.5-6.5_	4.571	6.5	8:35:00	4.075	0.496	
14/03/2022	MW196	0089_MW196_220314	NA	12.75	13.8	10:40:00	12.422	0.328	Hydrasleeve didn't fill up during recovery
14/03/2022	MW197		NA	2.28	NA	11:48:00	2.04	0.24	Well blocked around 2 m unable to sample
17/03/2022	MW199	0089_MW199_220317	NA	11.8	NA	8:48:00	11.39	0.41	
14/03/2022	MW200	0089_MW200_220314	NA	2.07	NA	12:18:00	1.84	0.23	
18/03/2022	MW202	0089_MW202_220318	NA	2.12	NA	11:21	1.72	0.4	
17/03/2022	MW203	0089_MW203_220317	NA	10.855	12.9	9:09:00	10.54	0.315	
16/03/2022	MW214	0089_MW214_220316	5.5-9_	8.075	9.0	09:05	7.605	0.47	
16/03/2022	MW215	0089_MW215_220316	1.5-4.5_	3.794	4.5	09:07	3.42	0.374	
16/03/2022	MW216	0089_MW216_220316	6-9_	8.329	6	8:51:00	7.8	0.529	
17/03/2022	MW217	0089_MW217_220317	6.5-9.5_	8.847	9.5	12:36:00	8.35	0.497	
17/03/2022	MW220		NA	NA	NA	13:11:00			Bore dry/blocked at 3.69mbgl
17/03/2022	MW224	0089_MW224_220317	11.25-14.25_	13.372	14.25	12:56:00	12.98	0.392	
16/03/2022	MW225	0089_MW225_220316	2-5_	4.066	5	10:33:00	3.69	0.376	
16/03/2022	MW226	0089_MW226_220316	0.75-3.8_	1.749	3.8	11:48:00	0.895	0.854	

Monitoring Date	Monitoring Location	Sample ID	Screen Interval (mbgl)	TOC (mAHD)	Well Depth (mbgl)	SWL Time	SWL (mbTOC)	RWL (mAHD)	Observations
16/03/2022	MW227	0089_MW227_220316	1.25-4.2_	2.961	4.2	12:38:00	2.702	0.259	
16/03/2022	MW228	0089_MW228_220316	0.75-3.75_	2.23	3.75	12:49:00	2	0.23	
17/03/2022	MW233	0089_MW233_220317	NA	3.705	4.968	11:52:00	3.31	0.395	
17/03/2022	MW236		NA	4.642	5.66	9:23:00			Bore Dry
18/03/2022	MW238	0089_MW238_220318	NA	4.827	NA	08:45	4.47	0.357	
18/03/2022	MW239	0089_MW239_220318	NA	4.03	NA	08:34	3.68	0.35	
18/03/2022	MW240	0089_MW240_220318	NA	4.483	6.8	08:54	4.1	0.383	
17/03/2022	MW242	0089_MW242_220317	NA	3.539	4.76	14:44:00	3.22	0.319	
18/03/2022	MW245	0089_MW245_220318	NA	4.551	5.65	08:26	4.21	0.341	
17/03/2022	MW248		NA	4.073	NA	14:08:00	3.85	0.223	Insuffient water volume for sample
17/03/2022	MW249	0089_MW249_220317	3.5-6.5_	5.227	6.5	14:23:00	4.99	0.237	
17/03/2022	MW255	0089_MW255_220317	3-6_	4.609	6	9:40:00	4.12	0.489	
17/03/2022	MW256	0089_MW256_220317	3-6_	3.84	6	10:05:00	3.34	0.5	
17/03/2022	MW257	0089_MW257_220317	2.7-5.7_	3.806	5.7	10:27:00	3.34	0.466	
17/03/2022	MW258		3-6_	4.043	6	10:50:00			Bore Dry
17/03/2022	MW259	0089_MW259_220317	2.5-5.5_	3.8	5.5	10:19:00	3.34	0.46	
17/03/2022	MW261	0089_MW261_220317	3-6_	3.858	6	11:30:00	3.73	0.128	
17/03/2022	MW264								Within a construction site - destroyd by recent earthw
17/03/2022	MW268	0089_MW268_220317	2.5-5.5_	4.056	5.5	13:29:00	3.78	0.276	
17/03/2022	MW269	0089_MW269_220317	2.5-5.5_	4.153	5.5	13:54:00	3.89	0.263	
15/03/2022	MW272								Not found
17/03/2022	MW282	0089_MW282_220317	4.5-7.5_	5.78	7.5	12:50:00	5.33	0.45	
18/03/2022	MW288	0089_MW288_220318	2.25-5.25_	4.003	5.25	09:43	3.7	0.303	
17/03/2022	MW289	0089_MW289_220317	3.25-6.25_	4.495	6.25	15:12:00	4.08	0.415	
14/03/2022	MW500	0089_MW500_220314	2-6.5_	3.692	6.5	10:06:00	3.233	0.459	
17/03/2022	MW516	0089_MW516_220317	4.5-7.5_	6.37	7.5	14:19:00	6.08	0.29	
17/03/2022	MW517	0089_MW517_220317	3-6_	4.77	6	9:31:00	4.27	0.5	
17/03/2022	MW518		3.5-6.5_	5.55	6.5	11:02:00			Bore dry

Monitoring Date	Monitoring Location	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	R1 - pH	Eh (mV)	QC Dup Sample #	Odour Comments	Colour
17/03/2022	MW010	HydraSleeve	24.1	1.24	1783	1177	7.32	-220.7			Clear
14/03/2022	MW109	HydraSleeve	25	1.32	1510	981.5	7.67	143.2	106/206		Clear
14/03/2022	MW112	HydraSleeve	22.5	3.4	579	377	7.78	70	105/205		Clear
14/03/2022	MW120	HydraSleeve	24.1	1.64	697	455	7.82	137	104/204		
14/03/2022	MW121	HandBailing	25.6	5.05	686	448.5	7.78	147.6	102/202		Cloudy
14/03/2022	MW123	HydraSleeve	20.4	2.18	1657	1079	7.38	45.3			Clear
14/03/2022	MW124	HydraSleeve	21.4	0.53	39644	27689	7.11	-247.3		Hydrogen sulfide	Clear
14/03/2022	MW125	HydraSleeve	23.6	0.65	45470	30348	7.17	-305.3	103/203		Clear
14/03/2022	MW126	HydraSleeve	23.5	0.27	41517	27770	7.03	-320.3		Hydrogen sulfide	Clear
14/03/2022	MW127	HydraSleeve	23.2	0.57	36314	24800	7.18	-286.3		Slight hydrogen sulfide	Clear
14/03/2022	MW128										
15/03/2022	MW137										
15/03/2022	MW139	HydraSleeve	23.1	1.5	12140	7891	7.59	-142.8			Clear
15/03/2022	MW141	HydraSleeve	22.1	0.84	26489	17231	7.11	-82.3			Clear
15/03/2022	MW142	HydraSleeve	22.1	2.27	34445	22392.5	7.24	47.4			Yellow
15/03/2022	MW147										
15/03/2022	MW149	HydraSleeve	22.6	2.09	52750	34320	7.66	-82.8			Clear
15/03/2022	MW158	HandBailing	21.9	1.18	15124	9834.5	7.19	62.8			Clear
15/03/2022	MW161	HydraSleeve	22	1.1	3893	2528.5	7.34	54.5			Clear
15/03/2022	MW166	HydraSleeve	20.8	1.31	4681	3042	7.36	56.7			Clear
15/03/2022	MW171	HydraSleeve	21.4	0.59	13905	9041.5	7.36	-212.7			Clear
15/03/2022	MW172										
15/03/2022	MW173	HandBailing	24.6	1.85	3686	2398.5	7.37	57.9			Clear
15/03/2022	MW193	HandBailing	22.3	1.38	4066	2632.5	7.48	-53			Cloudy
15/03/2022	MW195D	HydraSleeve	22.5	0.71	32683	21235.5	6.79	-104.5			Clear
15/03/2022	MW195S	HydraSleeve	22	0.95	5711	3711.5	7.14	71.5	111/211		Clear
14/03/2022	MW196	HandBailing	22.9	4.09	620	403	7.93	131.1	108/208		Cloudy
14/03/2022	MW197										
17/03/2022	MW199	HydraSleeve	21.2	2.13	8752	6140	7.01	118.3			Clear
14/03/2022	MW200	HydraSleeve	24.8	1.72	10507	6848	7.59	-77.9			Clear
18/03/2022	MW202	HydraSleeve	22.5	1.42	2340	1596	7.67	-236.4			Clear
17/03/2022	MW203	HydraSleeve	22.2	2.08	1100	752	7.62	-39.5			Clear
16/03/2022	MW214	HydraSleeve	20.2	2.2	10031	6519.5	6.56	109			Clear
16/03/2022	MW215	HydraSleeve	20.9	3.09	2583	1821	7.46	-43.6			Cloudy,Brown
16/03/2022	MW216	HydraSleeve	20.1	3	2296	1644	7.17	-41.7			Cloudy
17/03/2022	MW217	HydraSleeve	22.2	6.59	957	657	7.62	-11.3			Cloudy
17/03/2022	MW220										
17/03/2022	MW224	HydraSleeve	21.3	7.03	857	600	7.96	17.5			Cloudy
16/03/2022	MW225	HydraSleeve	20.4	1.34	2872	1865.5	7.62	-194.3			Clear
16/03/2022	MW226	HydraSleeve	23.9	0.66	43451	28242.5	7.11	-168.5			Brown,Clear

Monitoring Date	Monitoring Location	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	R1 - pH	Eh (mV)	QC Dup Sample #	Odour Comments	Colour
16/03/2022	MW227	HydraSleeve	22.8	0.47	7043	4576	7.49	-197.1		Pungent sulphur smell/stagnant water	Clear
16/03/2022	MW228	HydraSleeve	23.1	1.79	16409	10866	7.5	-161.7		Pungent sulphur smell/stagnant water	Cloudy
17/03/2022	MW233	HydraSleeve	18.8	3.32	342.1	252.1	8.5	-114.5			Clear
17/03/2022	MW236										
18/03/2022	MW238	HydraSleeve	22.3	1.06	663	454	7.73	6			Brown,Clear
18/03/2022	MW239	HydraSleeve	22.8	1.34	666	456	7.74	-34.7			Clear
18/03/2022	MW240	HydraSleeve	22.7	2.89	846	575	7.63	-44.1			Clear,Brown
17/03/2022	MW242	HydraSleeve	24.2	1.49	477.1	307.7	7.89	-73.6			Clear
18/03/2022	MW245	HydraSleeve	19.8	0.95	692	499	7.07	-260		Slight sulfidic	Clear,Brown
17/03/2022	MW248										
17/03/2022	MW249	HydraSleeve	22.5	0.92	1175	802	7.47	-178.8			Clear
17/03/2022	MW255	HydraSleeve	22.8	0.85	808	547	7.72	-173.5			Clear
17/03/2022	MW256	HydraSleeve	21	0.72	3737	2630	7.2	-248.2		Slight sulfidic	Clear
17/03/2022	MW257	HydraSleeve	22.1	1.96	521	358.4	7.77	-48			Clear
17/03/2022	MW258										
17/03/2022	MW259	HydraSleeve	20.7	2.36	638	451.5	7.83	-76.6			Cloudy,Brown
17/03/2022	MW261	HydraSleeve	22.5	1.18	1398	951	7.49	-109.6			Clear
17/03/2022	MW264	orks									
17/03/2022	MW268	HydraSleeve	22.9	1.29	5494	3719	7.26	64.2			Cloudy
17/03/2022	MW269	HydraSleeve	22.1	1.64	1700	1163	7.46	-224.2			Clear
15/03/2022	MW272										
17/03/2022	MW282	HydraSleeve	22.5	1.23	1179	804	7.09	-60.5			Cloudy
18/03/2022	MW288	HydraSleeve	23.2	1.11	861	579	7.67	-65.6			Clear
17/03/2022	MW289	HydraSleeve	23.3	1.09	1296	871	7.34	-84.7			Brown,Clear
14/03/2022	MW500	HydraSleeve	24	0.85	921	598	7.04	72.7			Clear
17/03/2022	MW516	HydraSleeve	22.2	0.88	1664	1141	7.32	-55.1			Clear
17/03/2022	MW517	HydraSleeve	23.1	1.29	3106	2093	7.23	-20.6			Cloudy
17/03/2022	MW518										

Monitoring Date	Monitoring Area	Monitoring Location	Sample_ID	Observations	Purge Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour Comments	Colour
18/03/2022	Stirling/Waste Water Treatment Plant East	PW304	0089_PW304_220318		Peristaltic pump	24.5	1.7	41247	27073	7.61	-211.7			Clear
16/03/2022	Stirling/Helicopter Support Facility	PW306	0089_PW306_220316		Peristaltic pump	24.6	4.01	55887	36594	7.7	32			Clear
16/03/2022	Stirling/Helicopter Support Facility	PW307	0089_PW307_220316		Peristaltic pump	24.2	3.59	55319	36562	7.82	59.9			Clear
16/03/2022	Stirling/Helicopter Support Facility	PW308	0089_PW308_220316		Peristaltic pump	24.2	4.43	28413	18750	8.04	49			Brown,Cloudy
16/03/2022	Stirling/Helicopter Support Facility	PW314	0089_PW314_220316		Peristaltic pump	24.8	1.68	56206	36702	7.55	41.7			Brown
16/03/2022	Stirling/Helicopter Support Facility	PW315	0089_PW315_220316		Peristaltic pump	24.5	3.73	56140	36940	7.66	57.1			Cloudy
16/03/2022	Stirling/Helicopter Support Facility	PW316	0089_PW316_220316		Peristaltic pump	24.5	4.21	56064	36806	7.87	-37.3			Clear
15/03/2022	Stirling/Demolition Ground	PW329	0089_PW329_220315		Peristaltic pump	26.2	1.49	57145	37115	7.73	-2.3	QC116/216		Clear
15/03/2022	Stirling/Demolition Ground	PW330	0089_PW330_220315		Peristaltic pump	25.5	1.83	57452	37375	7.86	13.1			Clear
15/03/2022	Stirling/Demolition Ground	PW331	0089_PW331_220315	QC114/214	Peristaltic pump	25.5	0.91	58760	38220	7.59	58.4	QC114/214		Clear
14/03/2022	Stirling/Fire Training Area	PW335	0089_PW335_220314		Peristaltic pump	23	4.15	54374	36750	8.06	60.5			Clear
14/03/2022	Stirling/Fire Training Area	PW340	0089_PW340_220314		Peristaltic pump	25.8	0.67	58496	37454	7.58	-117.9			Clear
14/03/2022	Stirling/Fire Training Area	PW341	0089_PW341_220314		Peristaltic pump	26.4	1.16	59392	37599	7.68	-169.4		Slight organic odour	Clear
14/03/2022	Stirling/Waste Water Treatment Plant East	PW345	0089_PW345_220314		Peristaltic pump	25.7	0.92	59113	37940	7.48	-42			Clear
18/03/2022	Stirling/Waste Water Treatment Plant East	PW346	0089_PW346_220318		Peristaltic pump	24.4	0.03	32493	21331	7.09	-351.8		Decomposing seaweed	Brown
14/03/2022	Stirling/Waste Water Treatment Plant West	PW350	0089_PW350_220314		Peristaltic pump	26	4.62	56464	36725	7.92	67			Clear
14/03/2022	Stirling/Waste Water Treatment Plant West	PW351	0089_PW351_220314		Peristaltic pump	26.9	3.26	56513	36725	7.84	61.9			Clear
14/03/2022	Stirling/Waste Water Treatment Plant West	PW352	0089_PW352_220314		Peristaltic pump	25.9	4.06	31412	20416	7.95	61.8			Clear
15/03/2022	Stirling/Demolition Ground	PW356	0089_PW356_220315		Peristaltic pump	24.9	1.44	58725	38155	7.42	70.8			Clear
15/03/2022	Stirling/Demolition Ground	PW357	0089_PW357_220315	QC118/218	Peristaltic pump	26.3	1.05	58198	37830	7.68	52.3	QC118/218		Clear
15/03/2022	Stirling/Demolition Ground	PW358	0089_PW358_220315		Peristaltic pump	26.9	0.65	56858	36935	7.55	-172.6			Clear
14/03/2022	Stirling/Fire Training Area	PW362	0089_PW362_220314	Lots of seaweed around	Peristaltic pump	27.4	1.4	60526	37600	7.64	-40.7		Slight organic odour	Clear
14/03/2022	Stirling/Fire Training Area	PW363	0089_PW363_220314		Peristaltic pump	25.9	0.68	58150	37186	7.56	-121.3			Clear
14/03/2022	Stirling/Fire Training Area	PW364	0089_PW364_220314	QC101/201	Peristaltic pump	25.7	0.74	58055	37267	7.67	-117.8	QC101/201		Clear
14/03/2022	Stirling/Waste Water Treatment Plant East	PW367	0089_PW367_220314	Seaweed around	Peristaltic pump	25.2	0.92	58624	37967	7.23	-45.2		Slight organic odour	Clear
18/03/2022	Stirling/Waste Water Treatment Plant East	PW368	0089_PW368_220318		Peristaltic pump	24.7	0.88	55655	36363	7.73	-191.8			Clear
14/03/2022	Stirling/Waste Water Treatment Plant East	PW369	0089_PW369_220314	Lots of seaweed	Peristaltic pump	25.9	0.72	58077	37130	7.46	-152.3			Clear
16/03/2022	Stirling/Dredge Spoil / Careening Bay	PW374	0089_PW374_220316		Peristaltic pump	25	3.31	57201	37202	7.9	1.5			Clear
16/03/2022	Stirling/Dredge Spoil / Careening Bay	PW375	0089_PW375_220316		Peristaltic pump	23.4	4.99	44720	29988	7.94	37.3			Clear
16/03/2022	Stirling/Dredge Spoil / Careening Bay	PW378	0089_PW378_220316		Peristaltic pump	24.1	5.05	49057	32458	7.94	45.4			Clear
14/03/2022	Stirling/Waste Water Treatment Plant West	PW380	0089_PW380_220314		Peristaltic pump	25.6	3.16	56359	36660	7.93	64.5			Clear
14/03/2022	Stirling/Waste Water Treatment Plant West	PW381	0089_PW381_220314		Peristaltic pump	25.8	3.62	56688	36855	7.96	60.7			Clear
14/03/2022	Stirling/Waste Water Treatment Plant West	PW401	0089_PW401_220314		Peristaltic pump	25.9	3.28	56361	36660	7.81	64.5			Clear
16/03/2022	Stirling/Helicopter Support Facility	PW405	0089_PW405_220316		Peristaltic pump	25.6	2.64	59870	38469	7.7	44.4			Clear
16/03/2022	Stirling/Helicopter Support Facility	PW407	0089_PW407_220316		Peristaltic pump	25.6	2.12	57626	37048	7.8	13.9			Clear
16/03/2022	Stirling/Helicopter Support Facility	PW409	0089_PW409_220316		Peristaltic pump	24.6	3.56	47677	31218	7.61	32.9			Clear
16/03/2022	Stirling/Helicopter Support Facility	PW411	0089_PW411_220316		Peristaltic pump	25.2	2.45	58040	37505	7.79	45.1			Clear
16/03/2022	Stirling/Helicopter Support Facility	PW413	0089_PW413_220316		Peristaltic pump	25	2.74	57594	37482	7.79	39.2			Clear
16/03/2022	Stirling/Helicopter Support Facility	PW415	0089_PW415_220316		Peristaltic pump	25.8	3.37	48341	30806	7.71	9.5			Clear

Site	Monitoring Location	Date	Sample ID	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	Observations	Temperature C	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Water Colour	Turbidity
Stirling/Fire Training Area	SW130	14/03/2022	0089_SW130_220314	Direct_into_Bottle	0.2	0.8	Some seaweed present	22.9	4.47	54308	36835	8	4.7	Clear	Medium
Stirling/Fire Training Area	SW132	14/03/2022	0089_SW132_220314	Direct_into_Bottle	0.1	0.9		24.7	4.18	56543	36947	8.05	85.8	Clear	Medium
Stirling/Fire Training Area	SW134	14/03/2022	0089_SW134_220314	Direct_into_Bottle	0.1	0.8	QC107/207	26.9	2.57	59412	37248	7.95	-183.9	Clear	Medium
Stirling/Demolition Ground	SW150	15/03/2022	0089_SW150_220315	Direct_into_Bottle	0.1	1	QC117/217	26.2	3.37	56744	36855	8.13	55.9	Clear	Low
Stirling/Demolition Ground	SW152	15/03/2022	0089_SW152_220315	Direct_into_Bottle	0.1	1		26.6	4.45	56737	36855	8.15	54.4	Clear	Low
Stirling/Demolition Ground	SW154	15/03/2022	0089_SW154_220315	Direct_into_Bottle	0.1	1	QC113/213	26.2	5.38	55888	36335	8.08	20.3	Clear	Low
Stirling/Demolition Ground	SW156	15/03/2022	0089_SW156_220315	Direct_into_Bottle	0.1	1		25.8	5.47	55646	36205	7.94	55.3	Clear	Low
Stirling/Waste Water Treatment Plant East	SW305	18/03/2022	0089_SW305_220318	Direct_into_Bottle	0.1	1		25.8	3.5	56632	36233	8.05	-219.1	Clear	Low
Stirling/Helicopter Support Facility	SW309	16/03/2022	0089_SW309_220316	Direct_into_Bottle	0.1	1		23.9	3.86	54237	36041	7.98	12.6	Clear	Low
Stirling/Helicopter Support Facility	SW310	16/03/2022	0089_SW310_220316	Direct_into_Bottle	0.1	0.8		23.3	4.14	54303	36514	8.02	57.9	Clear	Low
Stirling/Helicopter Support Facility	SW311	16/03/2022	0089_SW311_220316	Direct_into_Bottle	0.1	1		23.5	4.56	54400	36395	8.07	50.1	Clear	Low
Stirling/Dredge Spoil / Careening Bay	SW317	16/03/2022	0089_SW317_220316	Direct_into_Bottle	0.1	1		24.8	4.82	56016	36550	8.24	43.7	Clear	Low
Stirling/Dredge Spoil / Careening Bay	SW318	16/03/2022	0089_SW318_220316	Direct_into_Bottle	0.1	1		24.9	5.25	56666	36881	8.27	31.6	Clear	Low
Stirling/Dredge Spoil / Careening Bay	SW319	16/03/2022	0089_SW319_220316	Direct_into_Bottle	0.1	1		25	3.31	56905	37005	8.21	-48.5	Clear	Low
Stirling/Waste Water Treatment Plant West	SW353	14/03/2022	0089_SW353_220314	Direct_into_Bottle	0.1	1		25.7	4.45	55745	36205	7.98	72.6	Clear	Low
Stirling/Waste Water Treatment Plant East	SW370	14/03/2022	0089_SW370_220314	Direct_into_Bottle	0.1	0.9		28	3.2	59788	36798	7.94	-25.8	Clear	Medium
Stirling/Waste Water Treatment Plant East	SW371	18/03/2022	0089_SW371_220318	Direct_into_Bottle	0.1	1		26	3.47	56482	36032	8.02	-167.2	Clear	Low
Stirling/Waste Water Treatment Plant East	SW372	18/03/2022	0089_SW372_220318	Direct_into_Bottle	0.1	1		25.5	2.74	56145	36162	8.15	-239.5	Clear	Low
Stirling/Waste Water Treatment Plant East	SW373	18/03/2022	0089_SW373_220318	Direct_into_Bottle	0.1	1.1		25.5	3.66	55753	35860	8	-46.4	Clear	Low
Stirling/Waste Water Treatment Plant West	SW382	14/03/2022	0089_SW382_220314	Direct_into_Bottle	0.1	1		26.3	3.92	56095	36465	8.06	61.9	Clear	Low
Stirling/Waste Water Treatment Plant West	SW383	14/03/2022	0089_SW383_220314	Direct_into_Bottle	0.1	1	Sample misplaced in the field	25.7	4.27	56257	38595	8.04	64	Clear	Low
Stirling/Waste Water Treatment Plant West	SW384	14/03/2022	0089_SW384_220314	Direct_into_Bottle	0.1	1		25.8	4.05	56226	36530	8.05	65.7	Clear	Low
Stirling/Helicopter Support Facility	SW406	16/03/2022	0089_SW406_220316	Direct_into_Bottle	0.1	0.9		26.5	4.4	58606	37022	8.19	41.3	Clear	Low
Stirling/Helicopter Support Facility	SW408	16/03/2022	0089_SW408_220316	Direct_into_Bottle	0.1	1		26.2	5.17	58134	36953	8.19	-39.7	Clear	Low
Stirling/Helicopter Support Facility	SW410	16/03/2022	0089_SW410_220316	Direct_into_Bottle	0.1	1		25.5	4.75	57589	37021	8.2	-11.3	Clear	Low
Stirling/Helicopter Support Facility	SW412	16/03/2022	0089_SW412_220316	Direct_into_Bottle	0.1	0.9		25.2	4.41	57345	36728	8.14	43.7	Clear	Low
Stirling/Helicopter Support Facility	SW414	16/03/2022	0089_SW414_220316	Direct_into_Bottle	0.1	1		25.9	4.26	57465	36706	8.17	37.8	Clear	Low
Stirling/Helicopter Support Facility	SW416	16/03/2022	0089_SW416_220316	Direct_into_Bottle	0.1	0.9		25.5	4.32	57889	37097	8.17	-12.9	Clear	Low

Monitoring Area	Monitoring Location	Date	Sample ID	Depth of Sampling (m)	Sampling Method	Sample Condition	Sample Description	QC samples #
Stirling/Waste Water Treatment Plant East	SD304	18/03/2022	0089_SD304_220318	0.7	Shovel	Wet	Brown, sandy, no odour	
Stirling/Helicopter Support Facility	SD306	16/03/2022	0089_SD306_220316	0.8	Shovel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular	
Stirling/Helicopter Support Facility	SD307	16/03/2022	0089_SD307_220316	0.8	Shovel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular	
Stirling/Helicopter Support Facility	SD308	16/03/2022	0089_SD308_220316	0.8	Shovel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular	
Stirling/Helicopter Support Facility	SD314	16/03/2022	0089_SD314_220316	0.8	Shovel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular	
Stirling/Helicopter Support Facility	SD315	16/03/2022	0089_SD315_220316	0.8	Shovel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular	
Stirling/Helicopter Support Facility	SD316	16/03/2022	0089_SD316_220316	0.8	Shovel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular	
Stirling/Demolition Ground	SD329	15/03/2022	0089_SD329_220315	0.8	Shovel	Wet	Beige and grey coarse grained sand, poorly sorted, sub angular	QC115/215
Stirling/Demolition Ground	SD330	15/03/2022	0089_SD330_220315	0.9	Shovel	Wet	Beige coarse grained sand, poorly sorted, sub angular	
Stirling/Demolition Ground	SD331	15/03/2022	0089_SD331_220315	0.5	Shovel	Wet	Beige sand, coarse grained, no odour	
Stirling/Fire Training Area	SD335	14/03/2022	0089_SD335_220314	0.6	Shovel	Wet	Sand, coarse grained, trace shell fragments, no odour	
Stirling/Fire Training Area	SD340	14/03/2022	0089_SD340_220314	0.5	Shovel	Wet	No odour, coarse grained, sand, poorly sorted	
Stirling/Fire Training Area	SD341	14/03/2022	0089_SD341_220314	0.6	Shovel	Wet	Sand, coarse grained, trace organics, no odour	
Stirling/Waste Water Treatment Plant East	SD345	14/03/2022	0089_SD345_220314	0.5	Shovel	Wet	Sandy, trace organics no odour, poorly sorted	
Stirling/Waste Water Treatment Plant East	SD346	18/03/2022	0089_SD346_220318	0.7	Shovel	Wet	Brown, sandy with seaweed	
Stirling/Waste Water Treatment Plant West	SD350	14/03/2022	0089_SD350_220314	0.8	Shovel	Wet	Coarse grained sub angular beige sand	
Stirling/Waste Water Treatment Plant West	SD351	14/03/2022	0089_SD351_220314	0.8	Shovel	Wet	Coarse grained sub angular beige sand	
Stirling/Waste Water Treatment Plant West	SD352	14/03/2022	0089_SD352_220314	0.8	Shovel	Wet	Coarse grained sub angular beige sand	
Stirling/Demolition Ground	SD356	15/03/2022	0089_SD356_220315	0.5	Shovel	Wet	Beige sand, coarse grained, no odour	QC112/212
Stirling/Demolition Ground	SD357	15/03/2022	0089_SD357_220315	0.5	Shovel	Wet	Beige sand, coarse grained, no odour	
Stirling/Demolition Ground	SD358	15/03/2022	0089_SD358_220315	0.8	Shovel	Wet	Beige and grey coarse grained sand, poorly sorted, sub angular	
Stirling/Fire Training Area	SD362	14/03/2022	0089_SD362_220314	0.6	Shovel	Wet	Sand Coarse grained, trace organics, poorly sorted	
Stirling/Fire Training Area	SD363	14/03/2022	0089_SD363_220314	0.5	Shovel	Wet	Sand, coarse grained, grey, trace organics	
Stirling/Fire Training Area	SD364	14/03/2022	0089_SD364_220314	0.6	Shovel	Wet	Beige, coarse grained sand, trace shell fragments, no odour	
Stirling/Waste Water Treatment Plant East	SD367	14/03/2022	0089_SD367_220314	0.4	Shovel	Wet	Sandy trace organics slight organic odour	QC110/210
Stirling/Waste Water Treatment Plant East	SD368	18/03/2022	0089_SD368_220318	0.8	Shovel	Wet	Brown, sandy, no odour	
Stirling/Waste Water Treatment Plant East	SD369	14/03/2022	0089_SD369_220314	0.6	Shovel	Wet	Sand, coarse grained, no odour, poorly sorted	QC109/209
Stirling/Dredge Spoil / Careening Bay	SD374	16/03/2022	0089_SD374_220316	0.8	Shovel	Wet	Beige coarse grained sand, poorly sorted, sub angular	
Stirling/Dredge Spoil / Careening Bay	SD375	16/03/2022	0089_SD375_220316	0.9	Shovel	Wet	Beige coarse grained sand, poorly sorted, sub angular	
Stirling/Dredge Spoil / Careening Bay	SD378	16/03/2022	0089_SD378_220316	0.8	Shovel	Wet	Beige coarse grained sand, poorly sorted, sub angular	
Stirling/Waste Water Treatment Plant West	SD380	14/03/2022	0089_SD380_220314	0.8	Shovel	Wet	Coarse grained sub angular beige sand	
Stirling/Waste Water Treatment Plant West	SD381	14/03/2022	0089_SD381_220314	0.8	Shovel	Wet	Coarse grained sub angular beige sand	
Stirling/Waste Water Treatment Plant West	SD401	14/03/2022	0089_SD401_220314	0.8	Shovel	Wet	Coarse grained sub angular beige sand	
Stirling/Helicopter Support Facility	SD405	16/03/2022	0089_SD405_220316	0.8	Shovel	Wet	Beige coarse grained sand, poorly sorted, sub angular	
Stirling/Helicopter Support Facility	SD407	16/03/2022	0089_SD407_220316	0.8	Shovel	Wet	Beige coarse grained sand, poorly sorted, sub angular	
Stirling/Helicopter Support Facility	SD409	16/03/2022	0089_SD409_220316	0.8	Shovel	Wet	Beige grey coarse grained sand, poorly sorted, sub angular	
Stirling/Helicopter Support Facility	SD411	16/03/2022	0089_SD411_220316	0.8	Shovel	Wet	Beige grey coarse grained sand, poorly sorted, sub angular	
Stirling/Helicopter Support Facility	SD413	16/03/2022	0089_SD413_220316	0.8	Shovel	Wet	Beige grey coarse grained sand, poorly sorted , sub angular	
Stirling/Helicopter Support Facility	SD415	16/03/2022	0089_SD415_220316	0.8	Shovel	Wet	Beige coarse grained sand, poorly sorted , sub angular	

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Cardno
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 19L102400
Cable length: 1m 19H100045

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	174.50 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.33
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV -2 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	24	-0.2	°C	NA	23.8	°C
pH (21E)	pH 7.00	361531	7.01	-24.20	mV	6.98	7.01	pH
pH (21E)	pH 4.00	362911	4.00	150.30	mV	3.99	4.00	pH
Conductivity (19G100450)	2764 µs/cm at 25°C	21/2701	2764	GLP	4.99	2777	2764	µs/cm
ORP (200124SEN605102)	Zobell A & B	21/1611	232	232	mV	235.6	233.6	mV
Zero DO (20B140053)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.4	0.0	%
100% DO (20B140053)	100% Air Saturation	Air	100.0	6.29	uA	110.6	100.0	%

Calibrated by: [redacted]

Calibration Date: 26-Feb-22
Next Due: 25-Aug-22

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Cardno
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20D101040
Cable length: 1m 20B140029

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	176.50 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.84
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV -1 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	23.2	0	°C	NA	23.2	°C
pH (21J)	pH 7.00	361531	7.01	-17.00	mV	7.06	7.01	pH
pH (21J)	pH 4.00	362911	4.00	159.50	mV	4.04	4.00	pH
Conductivity (20A100065)	2764 µs/cm at 25°C	21/2701	2764	GLP	5.06	2753	2764	µs/cm
ORP (200408SIA605101)	Zobell A & B	21/1611	233	233	mV	237.2	234.3	mV
Zero DO (20C100608)	NaSO3 in distilled water	10175	0.0	NA	NA	-1	0.0	%
100% DO (20C100608)	100% Air Saturation	Air	100.0	6.23	uA	97.3	100.0	%

Calibrated by: [redacted]

Calibration Date: 01-Mar-22
Next Due: 28-Aug-22

Cardno®

Calibration Report

Multi-Parameter Water Quality Instrument

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105325
Cable length: 4m (21F100778)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition		
pH			
Condition			Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV			
pH 4 mV range + 165 to + 180 from 7 buffer mV value			174.70 mV
pH slope			55 to 60 mV/pH, ideal 59mV 58.56
Response time < 90 seconds			
Calibrated and conforms to manufacturer's specifications			
ORP			
Condition			Good, clean
Response time < 90 seconds			
within ± 80mv of reference Zobell Reading			
Calibrated and conforms to manufacturer's specifications			variance range ± 20mV 8 mV
Conductivity			
Condition			Good, clean
Temperature			°C
Conductivity cell constant 5.0 ± 1.0 in GLP file			
Clean sensor reads less than 3 uS/cm in dry air			
Calibrated and conforms to manufacturer's specifications			µs/cm
Dissolved Oxygen			
Condition			Good, clean
DO sensor in use			Galvanic
1.25 mil PE membrane (yellow membrane):			
DO Sensor Value			(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications			ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Calibration Point**	**Units**	**Before**		**After**		**Units**
Temperature	Check Temp NATA		°C	NA				°C
pH 21G	pH 7.00	7.01	mV	7.1	✓			pH
pH 21G	pH 4.00	4.00	mV	4.	✓			pH
Conductivity (21H100008)	~~2764 µs/cm~~ at 25°C	~~2764~~ 1413	5.03	1476	✓			µs/cm
ORP (Reference check only) 21O	Zobell A & B	235	mV	235	✓			mV
Zero DO (21G100131)	NaSO3 in distilled water	0.0	NA	0	✓			%
100% DO (21G100131)	100% Air Saturation	100.0	uA	100	✓			%

Calibrated by: **Calibration Date:**

Date of Bump Test	Project ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
15/03		YSI # 20D101040	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: ~~1,413µS/cm~~ Y / N 12880	—	pH 4.00: 4.20 pH 7.00: 7.11 EC: 12,950	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N		[redacted]	[redacted]
15/03		YSI # 19L102400	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: ~~1,413µS/cm~~ Y / N 12880	—	pH 4.00: 4.20 pH 7.00: 7.14 EC: 12,841.	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N		"	[redacted]
16/03		YSI # 21G105325	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: ~~1,413µS/cm~~ Y / N 12880	—	pH 4.00: 4.20 pH 7.00: 7.09 EC: 12690.	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
16/03		YSI # 19L102400	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: ~~1,413µS/cm~~ Y / N 12880	—	pH 4.00: 4.2 pH 7.00: 6.99 Temp: 4 EC: 128~~4~~10	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N		"	[redacted]
17/03		YSI # 21G105325	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N ~~[illegible]~~ 11280@18.5	18.5	pH 4.00: 4.14 pH 7.00: 7.09 Temp: 18.5 EC: 11299	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N		[redacted]	[redacted]
18/03		YSI # 21G105325	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N 11500@19.3	19.3	pH 4.00: 4.20 pH 7.00: 7.05 Temp: 19.3 EC: 11350	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N		[redacted]	[redacted]
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			

APPENDIX

E

DATA QUALITY REVIEW

Data Quality Review
PFAS Ongoing Monitoring Plan Quarterly Monitoring Factual Report

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as field blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 14 -18th March 2022 and is in general accordance with the proposed scope of work, as documented in the SAQP (ref DEF19009_ HMAS_Stirling_SAQP_Rev6) issued to the client and in general compliance with the Australian standards AS 4482.1- 2005 "*Guide to Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile Compounds",* Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling* and NEPM "*National Environment Protection (Assessment of Site Contamination) Measure".* A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (DEF19009_2022 Q1 OMP Factual Report_HMAS Stirling). In addition, a Health, Safety and Environment Work Method Statement (HSEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. **Groundwater, surface water and pore water:** No holding time non-compliance was reported for any water samples. **Sediment:** No holding time non-compliance was reported for the sediment samples.
Background samples	No background samples were collected as part of this investigation.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report, and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
	Data Precision & Accuracy

QC sample type	SAQP required frequency	Sample Collected
Blind duplicate	1 in 10 primary water samples (10%) >1 in 20 primary sediment samples (>5%)	14 for 123 primary water samples (11.4%) 4 for 39 primary sediment samples (10.2%)

QC sample Frequency

<table>
<tr><th>QA/QC Aspects</th><th>Evidence & Evaluation</th></tr>
<tr><td></td><td>
<table>
<tr><td>Split duplicate</td><td>1 in 10 primary water samples (10%)
>1 in 20 primary sediment samples (>5%)</td><td>14 for 123 primary water samples (11.4%)
4 for 39 primary sediment samples (10.2%)</td></tr>
<tr><td>Rinsate</td><td>1 per day / equipment used</td><td>9 (3x equipment for 1 day; 2x equipment for 2 days
and 1x equipment for 2 days) (100%)</td></tr>
<tr><td>Field Blank</td><td>1 per day / field team (esky)</td><td>9 (3x equipment for 1 day; 2x equipment for 2 days
and 1x equipment for 2 days) (100%)</td></tr>
</table>
QC sample frequency was compliant with the SAQP for water and sediment duplicates, rinsates and field blanks.
</td></tr>
<tr><td>QC Testing – Blind Replicates (Primary Lab)</td><td>
▪ Relative Percentage Difference (RPD) Acceptance Criteria:
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table>
Groundwater, Porewater & Surface water
▪ Number of primary samples analysed: 123
▪ Duplicate samples analysed: 14
The level of RPD is generally minor and probably related to the low analyte concentrations of analyte pairs. Where exceedances were recorded, further investigation into the result was conducted. For all RPD exceedances the primary sample reported either a greater concentration than the duplicate sample or a result of the same order of magnitude, therefore the results are considered to be conservatively reported.
Sediment
▪ Number of primary samples analysed: 39
▪ Duplicate samples analysed: 4
No RPD exceedances were noted for the sediment samples.
</td></tr>
<tr><td>QC Testing – Field Splits (Secondary Lab)</td><td>
▪ Relative Percentage Difference (RPD) Acceptance Criteria:
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table>
Groundwater, Porewater & Surface water
▪ Number of Samples Analysed: 123
▪ Field Split Samples Analysed: 14
The level of RPD is generally minor and probably related to the low analyte concentrations of analyte pairs and/or difference of methodologies between the primary and secondary laboratories. For all RPD exceedances the primary sample reported a greater concentration than the triplicate sample, therefore the results are considered to be conservatively reported.
Sediment
▪ Number of Samples Analysed: 39
▪ Field Split Samples Analysed: 4
No RPD exceedances were noted for the sediment samples.
</td></tr>
<tr><td>Field Blanks</td><td>Field Blanks were collected at a rate of one per field team (esky) per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.</td></tr>
</table>

QA/QC Aspects	Evidence & Evaluation
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, laboratory control samples and laboratory duplicates. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2202975 (sample ID: anonymous); EP2202976 (sample ID: anonymous); EP2203138 (sample ID: MW199). - Water sample Sulfate matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2202977 (sample ID: SW130) - Water sample Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2203138 (sample ID: anonymous); EP2203194 (sample ID: MW288). - PFOS matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2200211 (sample ID: MW500); EP2202976 (sample ID: anonymous); EP2203018 (sample ID: MW141) - Water sample PFHxS, PFHpS, PFOS, PFHxA and PFOA matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2299340 (sample ID: MW289); EP2200343 (sample ID: anonymous) - Water sample PFHxS matrix spike recovery not determined due to the background concentrations exceeding the 4x spike level. ▪ EP2200338 (sample ID: anonymous), EP2200339 (sample ID: MW282) - Water sample PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFHxA, PFHpA, PFOA matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. All Quality Control sample frequencies were of an acceptable rate (%) with exception of the following: ▪ EP2202976 – 7.69%; EP2202977 – 5.00%; EP2203018 – 7.96%; EP2203019 – 5.26%; EP2203057 – 9.09%; EP2203138 – 5.41%; EP2203194 – 5.56%; - Lab duplicates for PFAS were undertaken less than the target rate of 10%. ▪ EP2203195 – 0.00%. - Matrix spikes for PFAS were undertaken less than the target rate of 5%. ▪ EP2202980 – 0.00% & 0.00%; EP2203058 – 5.26% & 2.63%. - Lab duplicates and matrix spikes for PFAS were undertaken less than the target rate of 10% and 5%, respectively. ▪ EP2200289 - 0.00% & 0.00%; EP2200216 – 9.09% & 0.00%. - Lab duplicates and matrix spikes for Chloride and Sulfate were undertaken less than the target rate of 10% and 5%, respectively.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use. The equipment calibration certificates are provided in Appendix D. Cardno undertook in-field calibration checks (bump tests) for each YSI water quality meters per day of sampling. The bump tests found all parameters to be

QA/QC Aspects	Evidence & Evaluation
	within the acceptable range. As such, Cardno is satisfied that the equipment calibrations were acceptable for this assessment.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day when reusable equipment is used (i.e. YSI, dipper, pore water sampler...). All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection & analysis process for groundwater, porewater, surface water and sediment and therefore, the data set used as the basis for the investigation is considered valid and complete.

APPENDIX

F

INFORMATION ABOUT ENVIRONMENTAL REPORTS

About Site Environmental Assessment Reports

1. Introduction

This document explains the Environmental Site Assessment (ESA) process and the context that applies to the use of Environmental Reports issued by Cardno.

2. What is an ESA?

Environmental Site Assessments (ESA) are undertaken for a range of purposes, specific to the brief issued by the client in each case. The scope may include one or a combination of any of the following:

- A factual report of the condition of a portion of the site or one aspect of an entire site.
- Assessment of the contamination levels in soil to be removed from a site – a waste classification assessment.
- Validation of the success of remediation of a site or a portion of a site.
- Provision of a professional opinion about the suitability of a site for one or more uses, in terms of its contamination status.

The scope of any ESA needs to be defined at the outset.

An ESA is not an Environmental Audit. Such audits are undertaken in accordance with the provisions of regulations enacted in various states of Australia, and are referred to as Site Audits in some jurisdictions. Statutory audits provide certification by EPA accredited auditors that a site is suitable for one or more uses. An ESA may provide similar advice but cannot be used in place of an audit if the latter is required by regulation in any instance. However in some circumstances and jurisdictions an ESA is sufficient to provide "environmental sign-off" of a site.

An ESA may be undertaken for due diligence purposes, to establish whether the site has been impacted to the extent that some beneficial uses of the site may be precluded. Due diligence audits in many cases may be completed as non-statutory Audits, although in some jurisdictions they can also be statutory audits, if defined as such at the outset.

3. The ESA Process

The Client generally initiates the ESA process by specifying a brief which identifies the specific objectives of the assessment. If not, it is the consultants' duty to so specify the ESA

In the case of an ESA to provide an opinion about the suitability of the site for use, it would be conducted in accordance with NEPM (Site Assessment). Such ESA would not commence until a thorough site history assessment (Phase 1 Assessment: to identify the potential for significant contamination at a site) is conducted. However, where the history is unclear, a broad screening of chemical parameters can be used to test environmental media. This normally includes a broad range of organic and inorganic compounds and elements, often referred to as an Environmental Screen.

(In the case of an ESA for a purpose other than to provide an opinion about the suitability of the site for use, it is not always necessary to undertake a Phase 1 assessment.)

The ESA requires sampling of soil at representative locations across the site. A NATA accredited laboratory performs the analysis of soil. It is impractical for all of the soil to be assessed. The ESA is often based on a statistical method of grid or random sampling, augmented by targeted sampling at locations known or suspected to be contaminated. Guidance on sampling strategy and density is provided in Australian Standard AS4482.1–2005. However, some considerable degree of judgement is still required in the application of any sampling and testing strategy. For example the blanket application of the "hot spot" method presented in this standard is often inappropriate given its limitations.

The field program also investigates the likelihood of contamination below the site surface. Field investigations must sample and test fill as well as the natural soils. If contamination is found then it is common for further work to be undertaken to characterise, to the extent practical, its vertical and horizontal extent. However, where fill is encountered and testing shows it to be uncontaminated, it must be realised that the heterogeneous nature of the material might mean that not all pockets of contaminated material can be detected using normal sampling regimes.

EPA guidelines for auditors, that may be relevant for an ESA, indicate the need in all cases to consider the potential for groundwater contamination in any site. This does not mean all sites need to be drilled to sample groundwater, but it is most often the case. Most hydrogeological settings and groundwater conditions are complex and vary in space and time. The condition of groundwater is investigated to identify if any beneficial use or environmental value of groundwater is precluded due to contamination.

As previously stated for soil, all groundwater at the site cannot be tested. The environmental investigations are conducted in accordance with industry standards and guidelines (e.g. EPA Vic Pub 668). This provides a level of confidence that a sufficiently comprehensive assessment of the groundwater at the site is achieved.

Where an investigation shows that groundwater is polluted, consideration should be given to assessing the risks and the need for and practicality of any clean up.

4. Environmental Assessment Report

The ESA Report details the findings of the ESA. It provides summary information on the site definition, the reasons for the assessment and other relevant facts. It reviews the scope and quality of the site investigations, laboratory testing and data analyses undertaken. These reports also present a review of the contamination status of the site, the need for any further clean up, and an opinion on the suitability of the site for a range of beneficial uses and land uses such as “residential – low density”, “commercial” etc, as appropriate.

However, as noted above, some ESA have a narrow scope such as for classification of waste soil for removal from site, and do not make conclusions on suitability of site for use.

The ESA Report generally includes copies of other documents and reports, necessary to support the assessment findings, presented as appendices. These can contain more detailed information than the body of the ESA Report. Care should be taken to also read the appended documents and the ESA report in full.

Cardno generally issues reports in electronic form (e-Report) on CD ROM. ESA Reports are issued in this format as Adobe Acrobat™ PDF files. However, a paper copy of the executive summary of the ESA Report is generally issued to the client, and others as required by the brief or by regulation.

5. Limitations of Environmental Assessment Report

The ESA Report is prepared in a manner that can be easily read by a lay person with a legitimate interest in the contamination status of the site, such as the site owner or occupier, EPA and Local Planning Authority. The ESA report is not intended for use by other parties or for other purposes. Anyone who uses the assessment report for purposes other than specified in the report, does so at their own risk.

The site should only be used for one or more of the beneficial uses and land uses identified in the ESA as suitable.

The conditions and qualifications may apply to the suitability of the site for use, and it is the responsibility of the Client to be cognizant of and accept these in accepting the report. Cardno are only responsible for the issuing of the ESA report but accepts no liability for the costs incurred in the implementation of ESA findings.

The ESA provides a “snapshot” of the site conditions at the time of the site investigation. Consequently, the report may not be valid at a later time if there has been any change to the contamination status of the site in that time. Verification of the status of the site may be required in cases where a significant time has elapsed, or site conditions have changed since the assessment and audit.

The ESA is necessarily limited by constraints such as time, cost and available information; although normal professional practice at the time has been applied with all due care to prepare the report. A necessary requirement of this process is the horizontal and vertical interpolation of data from discrete locations. However, site conditions are generally not homogenous and some discrepancies will occur between the actual and predicted results at locations not directly sampled. There is a risk that contamination may occur at the site and not be identified by a competent investigation and assessment. The approach adopted in sampling (a combination of statistically based grid and judgmental sampling) seeks to reduce, but cannot eliminate, this risk.

Where unexpected occurrences of contamination arise, subsequent to the issue of the ESA Report, Cardno should be permitted to make an interpretation of these facts in relation to the ESA Report findings. Consequently, the Client should inform Cardno and seek their opinion. Cardno accepts no liability for costs incurred due to such

unexpected occurrences, given the inherent uncertainties in the assessment process.

Cardno uses information provided by other parties as the basis for the ESA, and reliance on this information is at the discretion of Cardno. However, however Cardno cannot guarantee any of the facts, findings or conclusions presented by other parties. Cardno will not be liable for the use of information, provided by others that is subsequently found to be intentionally misleading.

The ESA Report is not and does not purport to be anything other than a contaminated land ESA. It is not a geotechnical report and bore logs reproduced are for interpretation of the likely distribution of contamination. They are not intended for geotechnical interpretations and may not be adequate for this purpose.

The ESA Report is not intended to be a comprehensive analysis of the presence and associated risk of asbestos in buildings and services. Where asbestos in buildings and services is known or likely, the report may only caution that an appropriately qualified person be engaged to undertake demolition to avoid contamination of the site.

Cardno

13 August 2015

PFAS OMP Quarterly Sampling Event Factual Report

June 2022

HMAS Stirling

304700525



Prepared for
Department of Defence

13 October 2022

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluoro-hexane Sulphonate
PFOA	Per-fluoro-octanoic Acid
PFOS	Per-fluoro-octane Sulfonate

Technical Terms

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
BGL	Below Ground Level
CEC	Cation Exchange Capacity
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
EC	Electrical Conductivity
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity – Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTG	Fire Training Ground
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

Cardno was engaged by the Australian Department of Defence ("the Client") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) at HMAS Stirling ("the site"). The site is located on Garden Island, Western Australia.

The OMP was carried out in accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP):

> Cardno, 9 March 2022, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling* Rev 6.

The SAQP was reviewed prior to the monitoring event and no changes were required.

For the purposes of this report:

> The Management Area was defined as comprising of Garden Island and the marine nearshore environment (Figure 1A, Appendix A).

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF).

The purpose of this PFAS OMP factual report is to provide an up-to-date status of the condition of the site as it is currently understood in relation to the most recent sampling event.

The objectives of the report are:

> To provide a succinct summary of the Q2 2022 sampling event and provision of analytical results with supporting tables and figures.

> To provide confirmation of the current understanding of risk.

> To provide supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

This assessment has been undertaken in general accordance with applicable industry standards for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

> National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended 2013) (ASC NEPM).

> Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan (NEMP) 2.0*.

> Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.

> Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.

> Australian and New Zealand Guidelines, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

> Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[1].

> Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.

[1] It is noted that the site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-site properties and waterways.

> U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.

> USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*

> National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment. The PFAS source areas are shown on Figure 1B, Appendix A.

2.1 Groundwater Monitoring

Sampling of selected groundwater bores was performed in general accordance with the SAQP (Cardno, 2022), applying methods set out in Section 3 of this report. The groundwater bores monitored as part of the OMP are presented in Table 2-1, and are shown on Figures 2A and 2B, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID
Demolition Ground	MW137, MW139, MW141, MW142, MW147, MW149, MW272
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128
Waste water treatment plant	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203,
Accommodation Area	MW288, MW289
Dredged Sediments	MW264, MW268, MW269
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW516, MW248, MW249
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259, MW261, MW517, MW518, MW010
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2022), applying methods set out in Section 3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3A to 5B, Appendix A.

Table 2-2 Porewater, Surface Water and Sediment Monitoring Locations

Monitoring Area	Porewater Sampling Location ID	Sediment Sampling Location ID	Surface Water Sampling Location ID
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	SD329, SD330, SD331, SD356, SD357, SD358	SW150, SW152, SW154, SW156
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	SD335, SD340, SD341, SD362, SD363, SD364	SW130, SW132, SW134
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384
Accommodation Area	PW346	SD346	
Dredged Sediments	PW374, PW375, PW378	SD374, SD375, SD378	SW317, SW318, SW319
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416

2.3 Data Management

All the data included in the report has been collected, uploaded and reviewed according to the data management requirements of the *Defence Contamination Management Manual* (DCMM Annex L), including:

- The sample naming convention detailed in the DCMM Annex L was used in the field;
- All field data collected was uploaded to the ESdat database;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q2 2022 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW147	Not sampled	This well was found dry during this monitoring event. Medium impact – No data collected for Q2 2022, down-gradient well MW272 is missing.
MW196	Not sampled	This well was found dry during this monitoring event. No impact on the OMP as data was collected up-gradient (MW195S/D), down-gradient (MW197) and cross-gradient of this well (MW199).
MW248	Not sampled	Bore casing damaged by earthworks, unable to sample. Medium impact – No data collected, however MW516 was sampled nearby.
MW010	Not sampled	MW010 and MW518 were found damaged, MW261 and MW517 were not found. High impact on the OMP – A number of wells in the Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage Source Area have not been sampled during this monitoring event, therefore no data has been collected in the area for Q2 2022 (data gap).
MW261		
MW517		
MW518		
MW264	Not sampled	MW264 was destroyed by recent earthworks within the accommodation area. Medium impact – No data collected and a number of downgradient wells were also unable to be sampled.
MW137, MW272	Not sampled	These wells were not found and are assumed to have been destroyed by the winter 2021 storms which washed away part of the beach. Medium impact – No data collected. Other wells are sampled up-gradient. Replacement recommended due to proximity with both a source area and sensitive receptor.
Multiple (groundwater, porewater and surface water)	TDS and EC not recorded	Water quality meter malfunction. No impact on the OMP, these field parameters are not critical for the interpretation of potential PFAS impacts and risk assessment.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was generally undertaken by no purge HydraSleeve® method as detailed in Table 3-1.

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	Standing Water Levels (SWL) were gauged using an interface probe. All wells were measured against a surveyed mark at the top of the well casing. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater field parameters were recorded via a down-hole water quality meter (positioned within the mid screen interval) prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ electrical conductivity (EC) ▪ oxidation reduction potential (ORP) ▪ Dissolved oxygen (DO) ▪ Temperature Once field parameters were stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve	HydraSleeve were deployed with top weight for sample collection to begin at the lowest point. Following sampling, new hydraSleeves were deployed in preparation for the next OMP monitoring event using the same string for consistency (same depth of sampling i.e. within screen depth).
Retrieval of HydraSleeves (Sample Collection)	HydraSleeve sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the hydraSleeve. Purging of the well was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume). A sample was collected once field parameters had stabilised.
Decontamination procedure	Dedicated HydraSleeves and HDPE hand bailers were used at each groundwater bore thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample was identified with the sample location, date and project identification number. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

Activity	Details
Quality Control	Groundwater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and Chain of Custody documentation are included in Appendix C.

3.2 Porewater and Sediment Sampling Methodology

The methodologies for sediment and porewater sampling are detailed in Table 3-2 and Table 3-3 respectively.

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed, and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 20 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 20 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the USEPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.

Item	Detail
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 3-4.

Table 3-4 Surface water Sampling Methodology

Item	Details
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature Field observations such as odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container was positioned 10 cm below the surface water level where possible and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples were collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) *Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Surface water QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Surface water samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP:

> QA documentation.

> Bias.

> Data Representativeness.

- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability.
- Data Set Completeness.

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E. The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 3-5.

Table 3-5 Criteria for Groundwater, Porewater and Surface Water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health - Drinking Water Quality Guideline	0.07[1]	0.56	HEPA 2020
Human Health – Recreational Water	2[1]	10	HEPA 2020
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only; The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement.

3.5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment will be assessed against the NEMP (HEPA, 2020) soil criteria for consistency with the SAQP (Cardno, 2022), DSI (RPS, 2018b) and ERA (RPS, 2018c). The adopted assessment criteria for sediments are detailed in Table 3-6.

Table 3-6 Criteria for Sediment

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	mg/kg		
Human Health - Commercial / industrial (on-base activities)	20[1]	50	HEPA 2020
Ecological - Direct exposure (interim guidelines)	1[2]	10	HEPA 2020
Ecological - Indirect exposure (interim guidelines) (on site)	0.01[2]	-	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only

4 Field Observations and Results

4.1 General Site Observations

No weather event that could have impacted the sampling or results obtained was observed. Major earthworks were still ongoing at the main Base area which resulted in some groundwater monitoring well being damaged or destroyed (refer to Sections 2.4 and 4.6 for further details).

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling records, included in Appendix D. Field parameters were generally consistent with previous monitoring events. Groundwater pH was near neutral to slightly alkaline and water was observed clear to brown in colour. Groundwater temperature ranged from 13.1°C (MW214) to 22.0°C (MW242). DO readings mostly indicate aerobic groundwater condition. EC readings ranged from 242.6 µS/cm (MW233) to 73,403 µS/cm (MW228) and indicate fresh to highly-saline groundwater conditions. There was a sulphur odour noted at several groundwater wells. Hydrocarbon odour was recorded at several wells within fuel storage areas which is consistent with previous event's field records.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Appendix D. The groundwater elevations ranged between -0.083 mAHD (MW217) and 1.229 mAHD (MW199). It is expected that groundwater levels and flow direction for monitoring well relatively close to the shoreline are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours in discreet areas of the site. Groundwater flow was interpreted to be radial from the site (i.e. groundwater flows towards the ocean), following local topography, which is consistent with previous monitoring events. Groundwater inferred elevation contours and inferred flow direction for the Q2 2022 monitoring event are shown in Figure 6, Appendix A.

4.2.2 Groundwater Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-1. Laboratory results have also been compared to available historical data in order to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figures 2A and 2B in Appendix A presents the groundwater monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW141, MW172, MW193, MW236, MW282, MW500	0.56[2]	4.10 (MW282)	59	7
Sum of PFHxS and PFOS	MW109, MW112, MW120, MW121, MW123, MW125, MW128, MW141, MW142, MW161, MW166, MW171, MW172, MW173, MW193, MW202, MW215, MW216, MW217, MW220, MW224, MW228, MW233, MW236, MW240, MW243, MW249, MW255, MW256, MW258, MW259, MW268, MW269, MW282, MW288, MW289, MW500, MW516	0.07[2]	103.0 (MW236)	59	38

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOS	MW109, MW112, MW120, MW121, MW123, MW128, MW141, MW142, MW161, MW166, MW171, MW172 MW173, MW193, MW195D, MW202, MW216, MW217, MW220, MW224, MW233, MW236, MW242, MW243, MW245, MW249, MW255, MW256, MW257 MW259, MW269, MW282, MW288, MW289, MW500, MW516	0.01[3]	84.7 (MW236)	59	33

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> MW172 located at the WWTP reported new exceedances of the ecological guideline for PFOS (0.00023 µg/L, 6.47 µg/L detected), the recreational use guideline (2.0 µg/L, 13.2 µg/L detected) for the Sum of PFOS and PFHxS, and the drinking water guideline (0.56 µg/L, 0.66 µg/L detected) for PFOA. These were also first-time detections of PFOA and PFOS. It is noted that this monitoring well was sampled for the first time since 2017.

4.3 Surface Water

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Surface water pH was near neutral, temperature was 15.8°C on average, water was generally clear and EC readings indicate highly-saline conditions. DO readings indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data. Figures 3A and 3B in Appendix A presents the surface water monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	28	0
Sum of PFHxS and PFOS	SW305, SW370, SW371, SW372	0.07[2]	0.20 (SW373)	28	4
PFOS	SW134, SW305, SW370, SW371, SW372	0.01[3]	0.18 (SW371)	28	5

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> SW372 located to the east of the WWTP, recorded a new exceedance of the drinking water guideline for the Sum of PFOS and PFHxS (0.11 µg/L recorded). Concentrations of Sum of PFOS and PFHxS have been detected at this location during the DSI and since the start of ongoing monitoring.

4.4 Porewater

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Porewater pH was near neutral, with an average temperature of 15.4°C. Water was generally clear and EC/TDS readings indicate saline to highly-saline porewater conditions. DO readings mostly indicate aerobic porewater condition. No visual or olfactory evidence of contamination were observed.

4.4.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data. Figures 4A and 4B in Appendix A presents the porewater monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-3 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	39	0
Sum of PFHxS and PFOS	PW345, PW346, PW356, PW368	0.07[2]	1.12 (PW346)	39	6
PFOS	PW304, PW308, PW335, PW340, PW341, PW345, PW346, PW352, PW356, PW362, PW363, PW364, PW367, PW368, PW369	0.01[3]	0.50 (PW345)	39	15

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> PW356 located downgradient of the demolition ground recorded a new exceedance of the drinking water guideline for the Sum of PFOS and PFHxS (0.10 µg/L recorded). A detectable Sum of PFOS and PFHxS concentration had previously been recorded at this location in 2018.

> PW368 located to the east of the WWTP, recorded a new exceedance of the drinking water guideline for the Sum of PFOS and PFHxS (0.33 µg/L recorded). Concentrations of Sum of PFOS and PFHxS have been detected at this location during the DSI and since the start of ongoing monitoring.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D. Sediment samples were generally described as beige/grey, coarse, wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. Soil criteria are adopted in the absence of criteria for sediment for consistency with the SAQP (Cardno, 2022), DSI (RPS, 2018b) and ERA (RPS, 2018c). A summary of results is presented in Table 4-4. Laboratory results have also been compared to available historical data. Figures 5A and 5B in Appendix A presents the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-4 Summary of Sediment Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (mg/kg)	Max Conc. (mg/kg)	No. Analytical Results[4]	No. Results Above Criteria
PFOA	-	10[1]	<0.0002	39	0
Sum of PFHxS and PFOS	-	20[3]	0.0021 (SD369)	39	0
PFOS	-	0.01[2]	0.0021 (SD369)	39	0

Notes:

1. Ecosystems – direct exposure
2. Ecological - indirect exposure
3. Human health – comm/industrial
4. Non-inclusive of quality control samples

Findings are summarised as follows:

- No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the sediment monitoring locations in Q2 2022.
- All sediment samples reported concentrations either below the LOR or at detectable values below the adopted assessment criteria.

4.6 Changes to the Monitoring Network Condition

The following changes to the monitoring network were noted during the Q2 2022 monitoring event:

- MW010, MW248, MW518 were found damaged, preventing sampling.
- MW128, MW258 and MW172 were unblocked with a steel bailer and sampled.
- MW137, MW264, MW272, MW517 were not found (assumed destroyed)
- MW261 wasn't found (assumed gatic lid was covered by mulch)

5 Summary and Conclusions

Cardno undertook the 2022 Q2 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Groundwater sampling and testing was undertaken at 59 monitoring bores, 28 surface water locations and 39 sediment and porewater co-located sampling locations. Of the 10 monitoring wells that could not be sampled, two were found dry or blocked and eight were not found (assumed destroyed).

Groundwater levels were gauged in all wells before sampling. Groundwater flow was interpreted to be radial from the site where mounding of groundwater is occurring (i.e. groundwater follows the site's topography and flows towards the ocean), consistent with the previous monitoring events.

The groundwater laboratory results reported the following:

- Of the 59 samples that were tested, PFOA (7 samples), PFOS (33 samples) and Sum of PFHxS and PFOS (38 samples) reported concentrations that exceeded adopted assessment criteria.
- MW172 located at the WWTP reported new exceedances of the ecological guideline for PFOS, the recreational use guideline for the Sum of PFOS and PFHxS, and the drinking water guideline for PFOA. These were also first-time detections of PFOA and PFOS. It is noted that this monitoring well was sampled for the first time since 2017.

The surface water laboratory results reported the following:

- Of the 28 samples tested, PFOS (5 samples) and Sum of PFHxS and PFOS (4 samples) were reported above the adopted assessment criteria.
- SW372 located to the east of the WWTP, recorded a new exceedance of the drinking water guideline for the Sum of PFOS and PFHxS.
- No first time detect of PFOA or the sum of PFOS and PFHxS above the LOR was reported for the surface water monitoring locations.

The porewater laboratory results reported the following:

- Of the 39 samples that were tested, PFOS (15 samples) and Sum of PFOS and PFHxS (6 samples) reported concentrations above adopted assessment criteria.
- PW356 located downgradient of the demolition ground recorded a new exceedance of the drinking water guideline for the Sum of PFOS and PFHxS.
- PW368 located to the east of the WWTP, recorded a new exceedance of the drinking water guideline for the Sum of PFOS and PFHxS.
- No first-time detections of PFOA or the sum of PFOS and PFHxS above the LOR were reported for the porewater monitoring locations.

The sediment laboratory results reported the following:

- Of the 39 samples that were tested, no sampling location reported a first-time detection or new exceedance of guideline values.

The following actions should be undertaken prior to the next OMP sampling event:

- Replacement of the ground water monitoring wells lost at the demolition ground and main base area.

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q3 2022), scheduled for September 2022. An Annual Interpretive Report will be prepared following the Q3 2022 monitoring event for the 2021 –2022 reporting period.

6 References

General References

1. Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds*.
2. Australian Standard AS 4482-1999 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 2 – Volatile substances*.
3. *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC and ARMCANZ, 2000).
4. *Contaminated Sites Act 2003*, Western Australia.
5. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement *Technical Guidelines for the Estimation of Emissions by Facilities in Australia*.
6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
8. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, '*Guidance on Environmental Data Verification and Data Validation'.*
9. The Heads of EPAs Australia and New Zealand (HEPA; 2020) *PFAS National Environmental Management Plan (NEMP) 2.0*, January 2020.
10. National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011 – updated 2018) *National Water Quality Management Strategy Australian Drinking Water Guidelines 6*, August 2018
12. NHMRC, August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.
13. Standards Australia/Standards New Zealand (1998) AS5667.1:1998 *'Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'*.
14. U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4).*
15. USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*

Site Specific References

16. Department of Defence, January 2019, *HMAS Stirling Garden Island PFAS Management Area Plan*, Final.
17. Cardno, 9 March 2022, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling*. Rev 6
18. Cardno, 16 April 2020, *PFAS OMP 2019 Q4 Quarterly Monitoring Factual Report*, HMAS Stirling
19. Cardno, 14 May 2020, *PFAS OMP 2020 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling
20. Cardno, 23 September 2020, *PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling
21. Cardno, 22 January 2021, *PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling
22. Cardno, March 2021, *PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling
23. Cardno, June 2021, *PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling
24. Cardno, August 2021, *PFAS OMP 2021 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling
25. Cardno, September 2021, *PFAS OMP – 2020 Annual Interpretive Report*, HMAS Stirling
26. Cardno, November 2021, *PFAS OMP 2021 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling
27. Cardno, April 2022, *PFAS OMP 2021 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling

28. Cardno, now Stantec, July 2022, *draft PFAS OMP 2021 Annual Interpretive Report*

29. Cardno, now Stantec, July 2022, *PFAS OMP 2022 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling

30. RPS, October 2018, *HMAS Stirling - PFAS Ongoing Monitoring Plan*, Ref. EEC16094.005 (RPS, 2018a).

31. RPS, May 2018, *Detailed Site Investigation – HMAS Stirling PFAS Investigation*, Ref. EEC16094.003 (RPS, 2018b).

32. RPS, September 2018, *HMAS Stirling Garden Island PFAS Investigation Ecological Risk Assessment*. Ref. EEC16094.009 (RPS, 2018c).

APPENDIX

A

FIGURES

Cardno

now

Stantec



FIGURE 1A

1:32,000 Scale at A3

Meters

0 500 1,000

Site Location

Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001A_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map

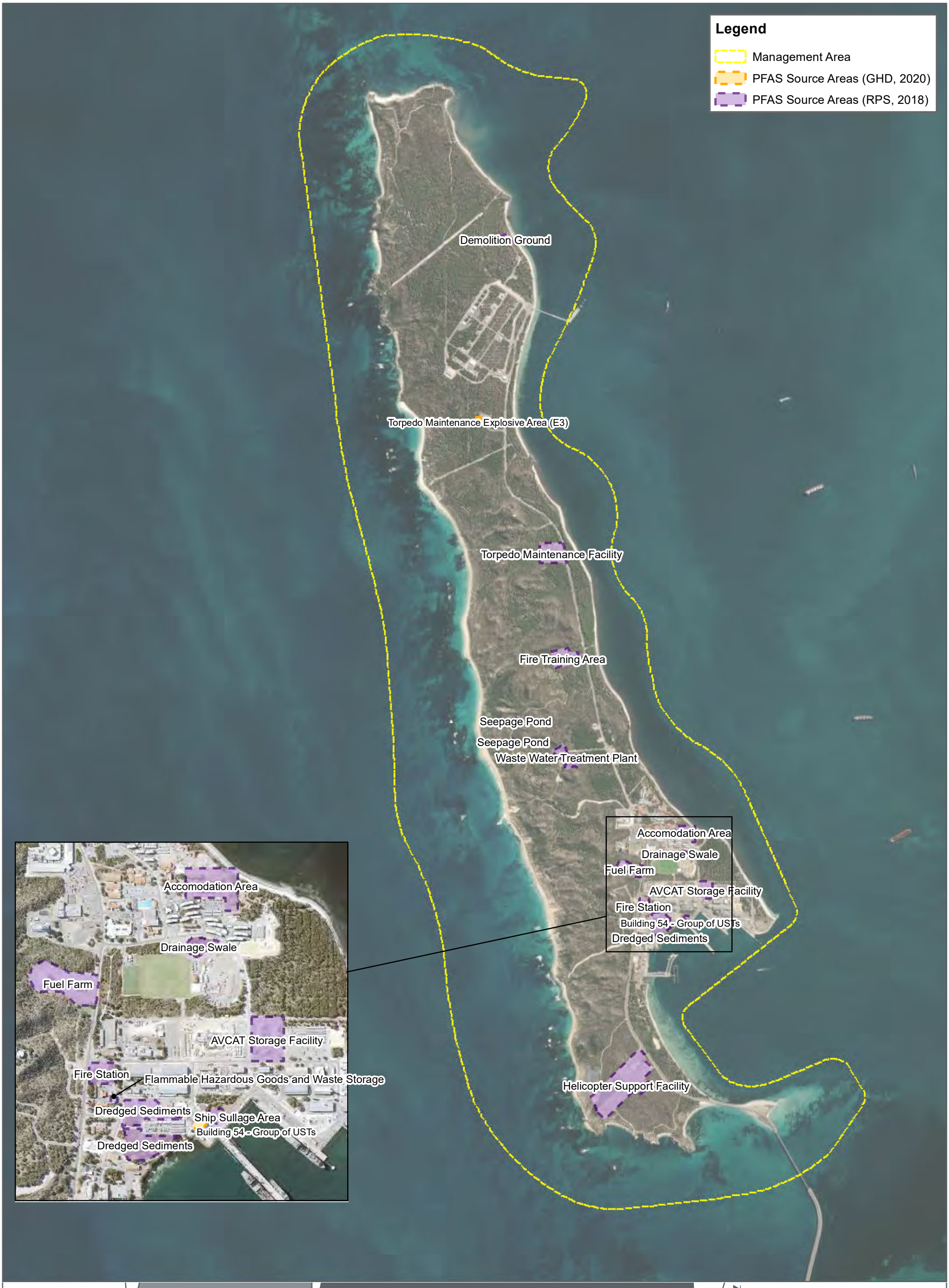


FIGURE 1B

1:32,000 Scale at A3

Meters

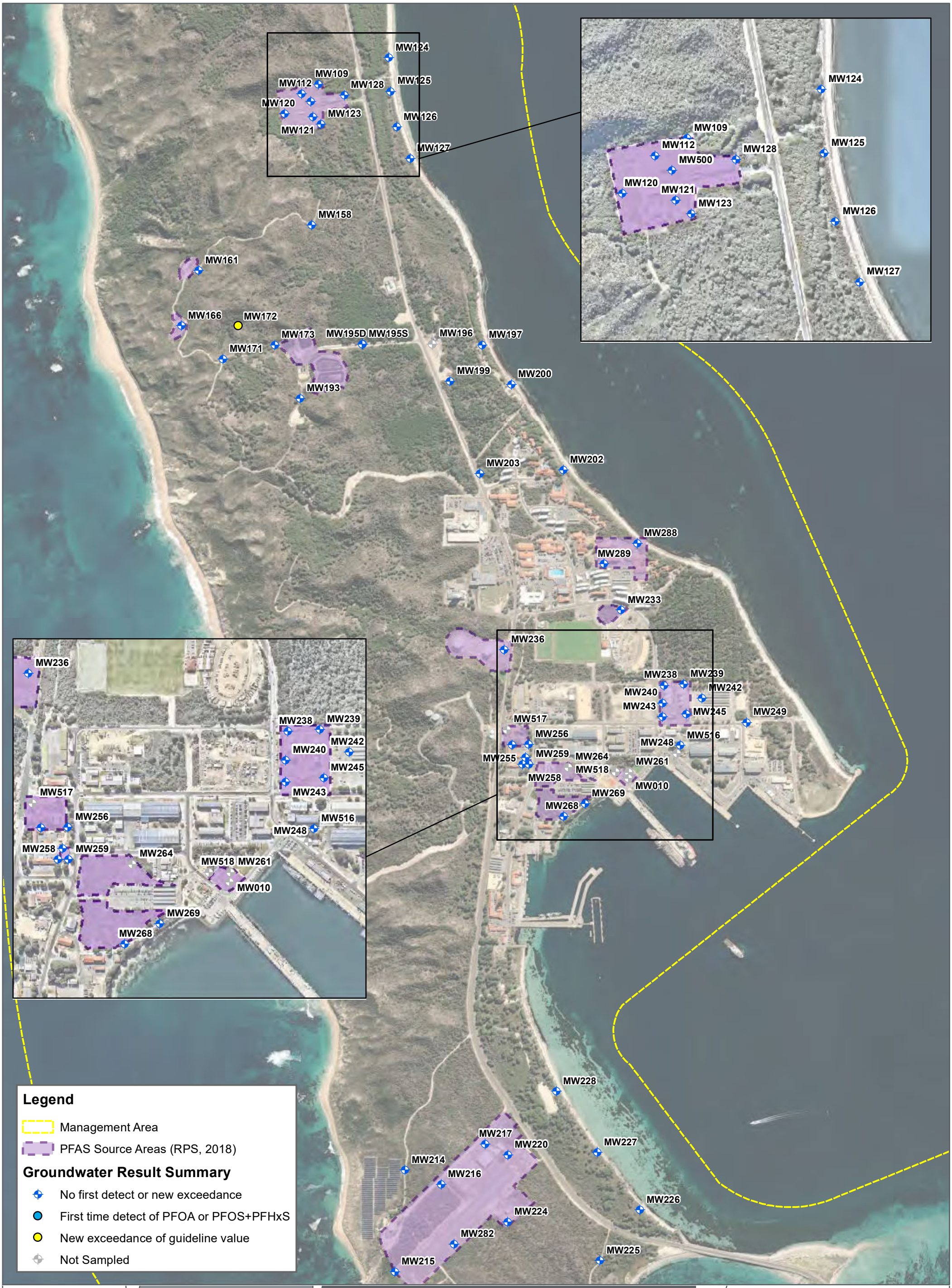
0 500 1,000

Management Area

Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap


MW124
MW109
MW112
MW128
MW125
MW120
MW123
MW126
MW121
MW127
MW158
MW161
MW166
MW172
MW173
MW195D
MW195S
MW196
MW197
MW171
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW249
MW517
MW256
MW516
MW248
MW255
MW259
MW264
MW261
MW518
MW258
MW010
MW269
MW268
MW228
MW217
MW220
MW227
MW214
MW216
MW226
MW224
MW282
MW225
MW215
MW500
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Result Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
Not Sampled
FIGURE 2A
1:12,500 Scale at A3
Meters
0
300
600
Groundwater Results
Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2022Q2_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap


MW137
MW142
MW141
MW147
MW272
MW139
MW149
MW141
MW272
MW149
MW139
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Result Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
Not Sampled
FIGURE 2B
1:15,000 Scale at A3
Meters
0
250
500
Groundwater Results
Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002B_2022Q2_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

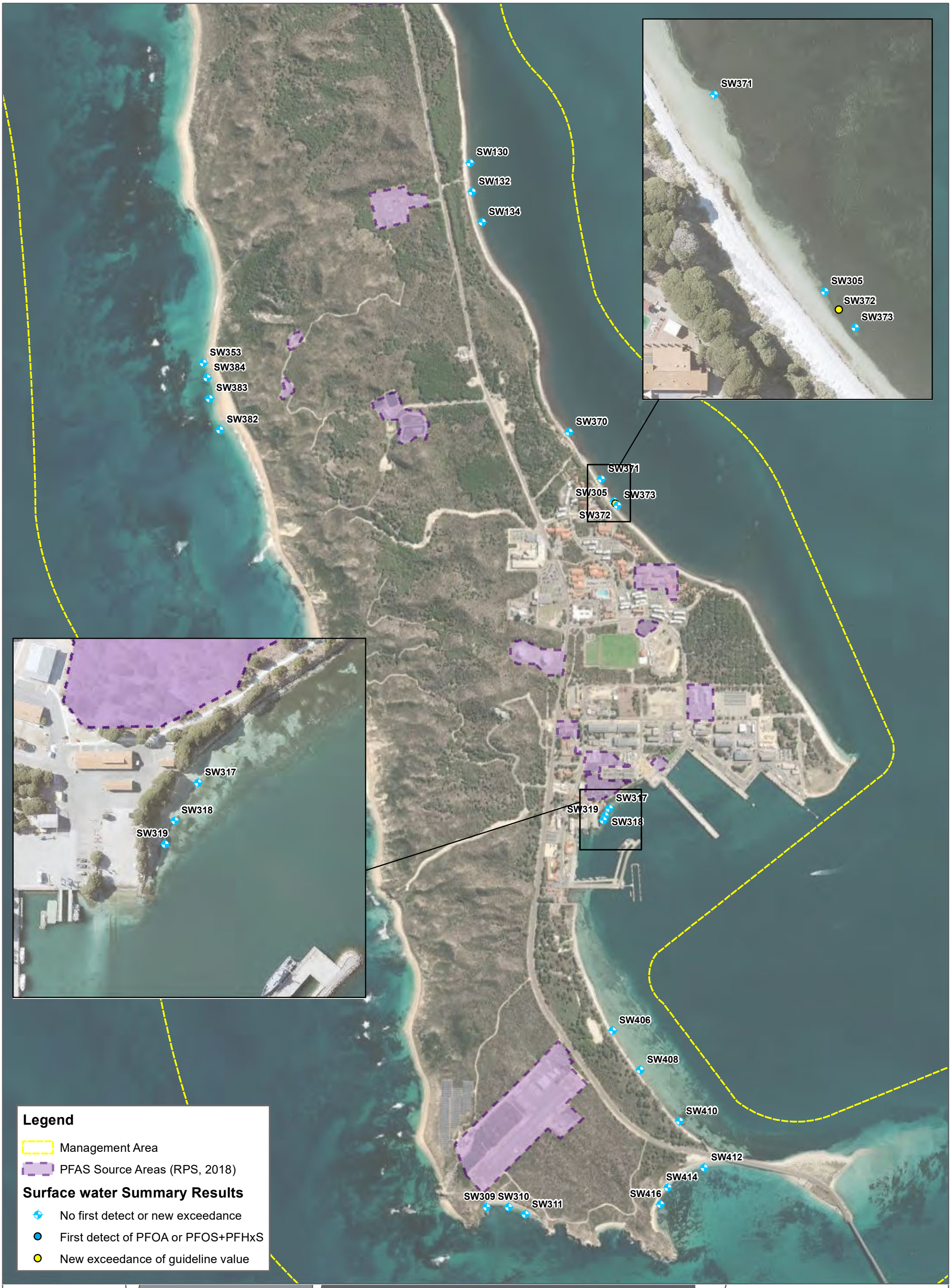


FIGURE 3A

1:15,000 Scale at A3

Meters

0 300 600

Surface water Results

Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_2022Q2_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap

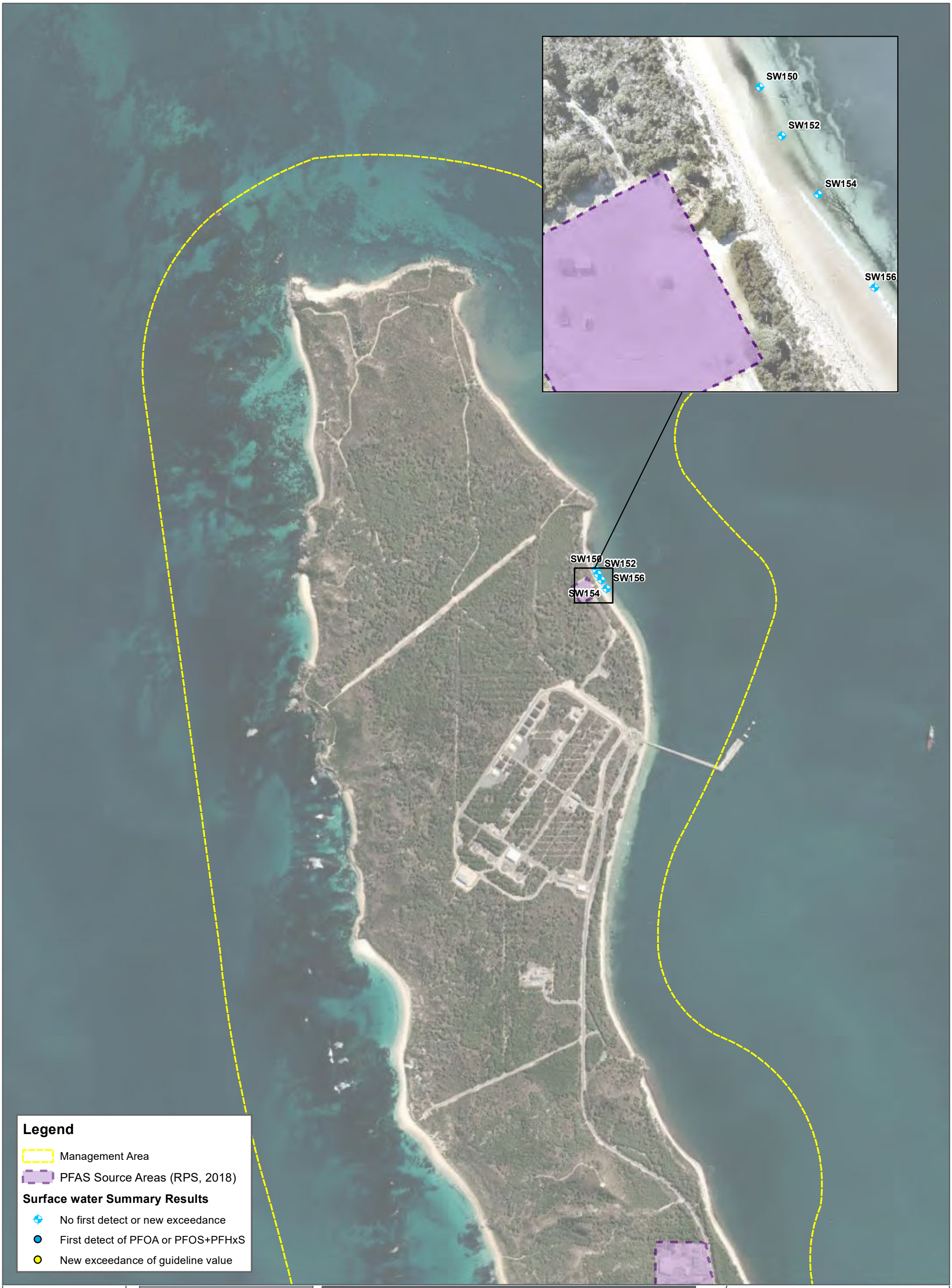


FIGURE 3B

1:15,000 Scale at A3

Meters

0 300 600

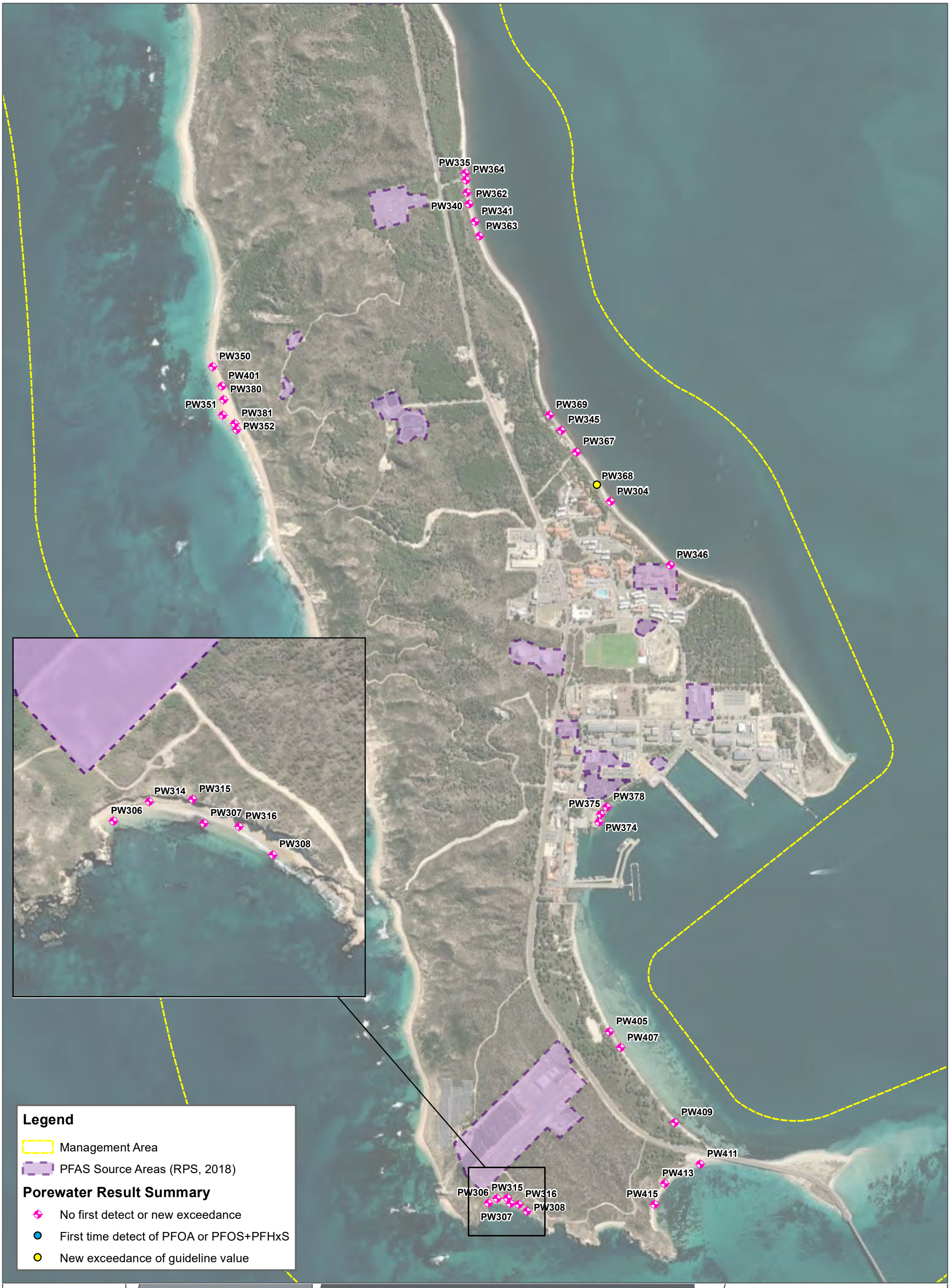
Surface water Results

Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_2022Q2_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap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PW375
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PW405
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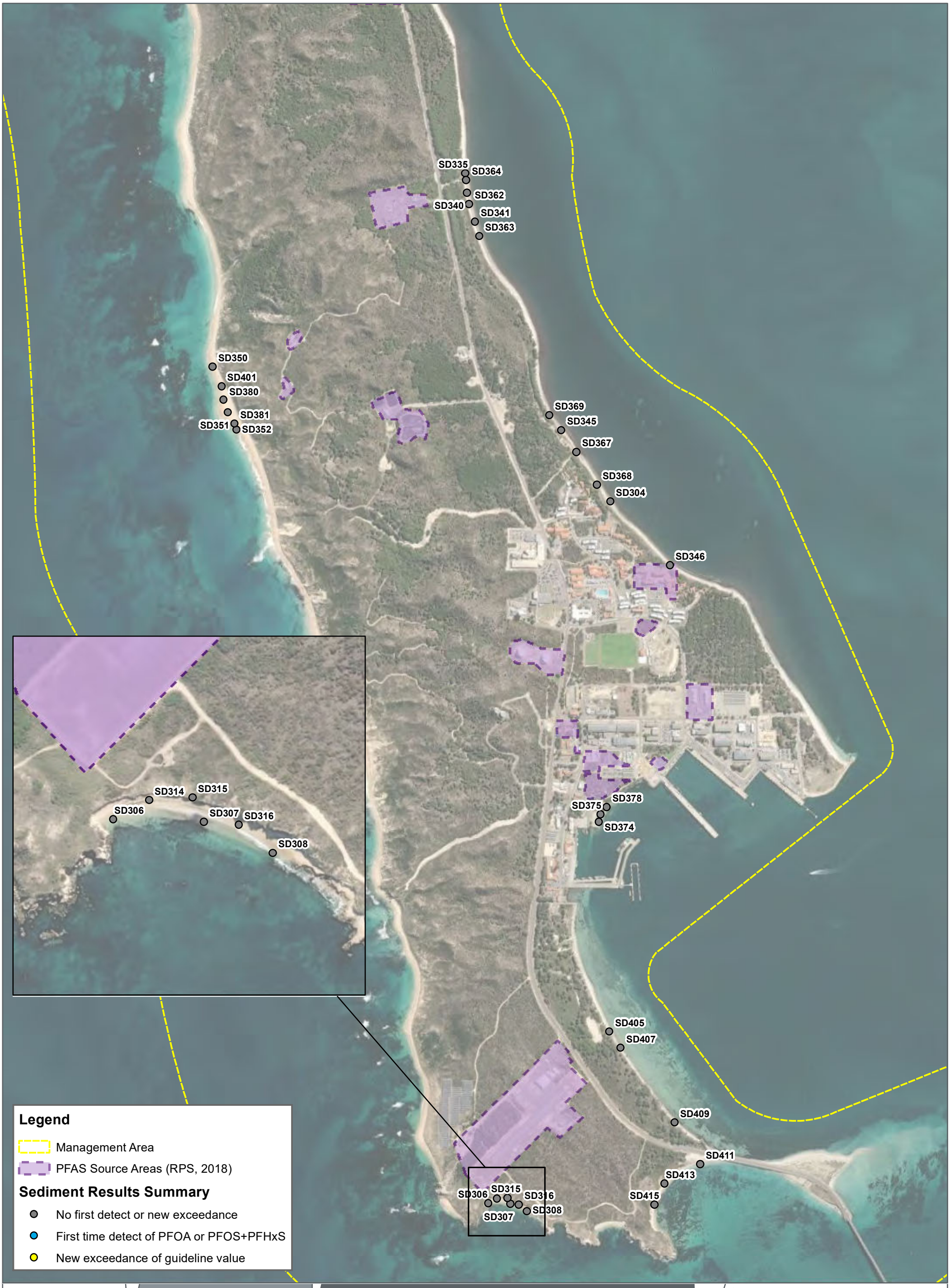
PW409
PW411
PW413
PW415
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Porewater Result Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 4A
1:15,000 Scale at A3
Meters
0
300
600
Porewater Results
Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004A_2022Q2_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth


PW356
PW331
PW357
PW330
PW358
PW329
PW631
PW356
PW358
PW329
PW357
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Porewater Result Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 4B
1:15,000 Scale at A3
Meters
0
300
600
Porewater Results
Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004B_2022Q2_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap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SD374
SD405
SD407
SD409
SD411
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SD415
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SD316
SD308
SD307
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sediment Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 5A
1:15,000 Scale at A3
Meters
0
300
600
Sediment Results
Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2022Q2_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 5B

1:15,000 Scale at A3

Meters

0 300 600

Sediment Results

Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2022Q2_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

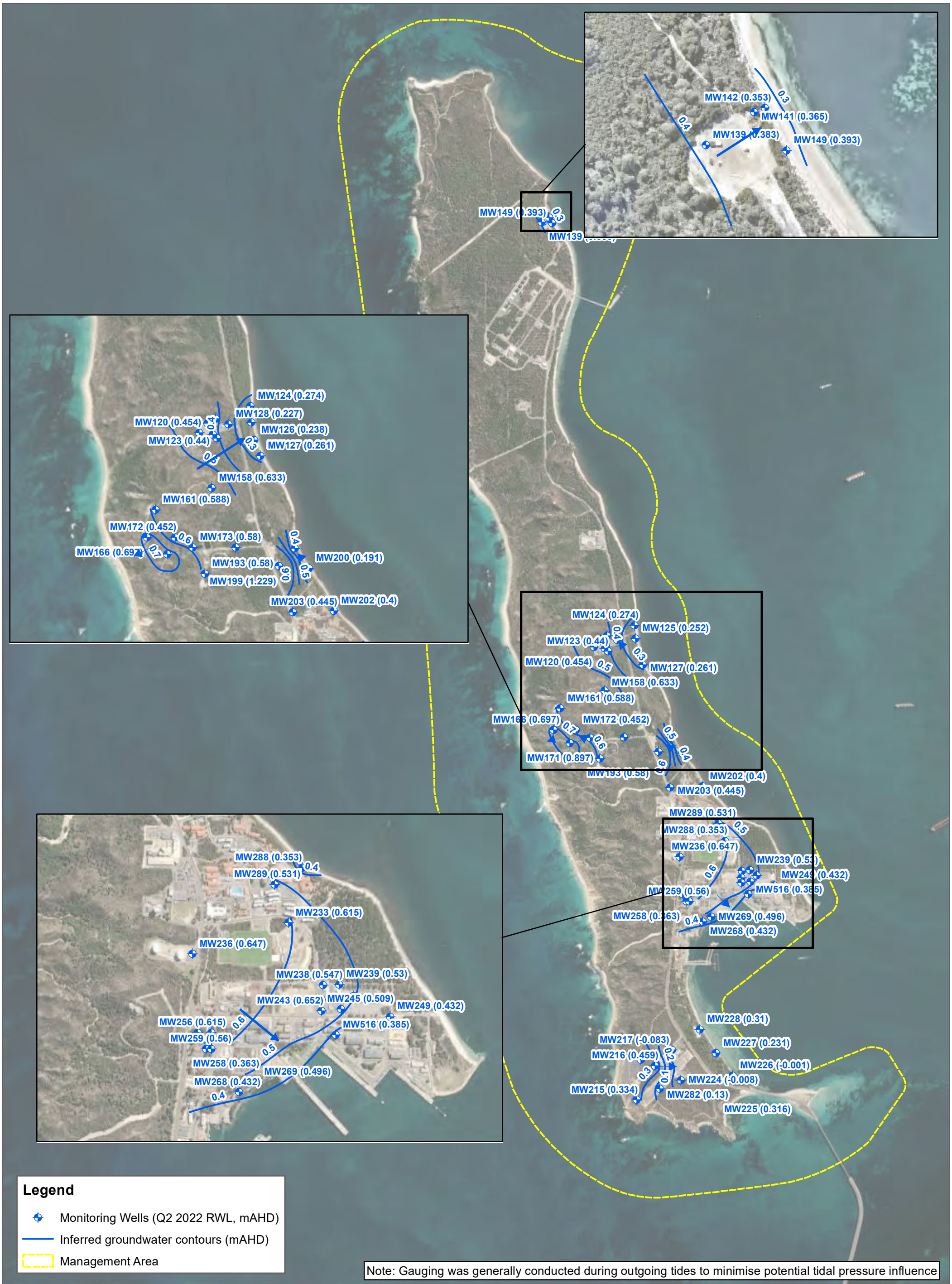

FIGURE 6

1:32,000 Scale at A3

Meters

0 500 1,000

Inferred Groundwater Contours

Q2 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2022-09-08 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2022Q2_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

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						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.002	0.002	0.002	0.002	0.004	0.004	0.008	0.002	0.001	0.004	0.001	0.002	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Field ID**	**Date**	**Sample Type**	**Lab Report No.**																	
Fire Training Area	**MW109**	**0089_MW109_220607**	**7/06/2022**	**Normal**	**EP2206880**	0.14	0.36	6.15	0.52	4.64	<0.02	<0.1	0.15	0.81	0.09	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW109**	**0089_QC107_220607**	**7/06/2022**	**Field Duplicate**	**EP2206880**	0.15	0.35	5.70	0.50	4.47	<0.02	<0.1	0.16	0.81	0.08	0.28	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW109**	**0089_QC207_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	0.14	0.29	4.0	0.38	2.3	<0.004	0.085	0.12	0.63	0.078	0.22	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Fire Training Area	**MW112**	**0089_MW112_220607**	**7/06/2022**	**Normal**	**EP2206880**	0.02	0.13	7.64	1.52	73.6	<0.02	<0.1	0.12	0.59	0.23	*0.99*	0.08	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW112**	**0089_QC105_220607**	**7/06/2022**	**Field Duplicate**	**EP2206880**	0.02	0.15	8.02	1.43	80.8	<0.02	<0.1	0.12	0.60	0.25	*1.00*	0.08	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW112**	**0089_QC205_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	0.027	0.15	3.0	0.73	6.7	<0.004	0.045	0.098	0.68	0.19	*1.1*	0.071	0.006	<0.001	<0.001	<0.001	<0.001
Fire Training Area	**MW120**	**0089_MW120_220607**	**7/06/2022**	**Normal**	**EP2206880**	0.02	0.05	3.52	0.74	1.64	<0.02	<0.1	<0.02	0.10	<0.02	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW121**	**0089_MW121_220607**	**7/06/2022**	**Normal**	**EP2206880**	0.05	0.16	5.30	0.22	0.59	<0.02	<0.1	0.13	0.46	0.08	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW121**	**0089_QC101_220607**	**7/06/2022**	**Field Duplicate**	**EP2206880**	0.05	0.16	5.40	0.27	0.72	<0.02	<0.1	0.12	0.45	0.08	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW121**	**0089_QC201_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	0.046	0.11	4.4	0.17	0.45	<0.004	0.047	0.087	0.41	0.070	0.16	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Fire Training Area	**MW123**	**0089_MW123_220607**	**7/06/2022**	**Normal**	**EP2206880**	0.20	0.18	0.57	<0.02	0.05	<0.02	<0.1	0.12	0.46	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW124**	**0089_MW124_220607**	**7/06/2022**	**Normal**	**EP2206880**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW125**	**0089_MW125_220607**	**7/06/2022**	**Normal**	**EP2206880**	0.18	0.24	0.98	<0.02	<0.01	<0.02	<0.1	0.04	0.25	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW126**	**0089_MW126_220607**	**7/06/2022**	**Normal**	**EP2206880**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW127**	**0089_MW127_220607**	**7/06/2022**	**Normal**	**EP2206880**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW128**	**0089_MW128_220608**	**8/06/2022**	**Normal**	**EP2206971**	<0.02	<0.02	0.32	0.05	6.22	<0.02	<0.1	<0.02	0.03	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**MW139**	**0089_MW139_220608**	**8/06/2022**	**Normal**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**MW141**	**0089_MW141_220608**	**8/06/2022**	**Normal**	**EP2206969**	0.49	1.07	13.3	1.62	40.3	<0.02	0.2	0.67	5.54	0.28	*1.34*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**MW142**	**0089_MW142_220608**	**8/06/2022**	**Normal**	**EP2206969**	0.03	0.07	1.55	0.05	2.32	<0.02	<0.1	0.08	0.67	<0.02	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**MW149**	**0089_MW149_220608**	**8/06/2022**	**Normal**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW158**	**0089_MW158_220607**	**7/06/2022**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW161**	**0089_MW161_220607**	**7/06/2022**	**Normal**	**EP2206883**	0.05	0.06	0.84	0.11	4.21	<0.02	<0.1	0.15	0.23	0.09	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW166**	**0089_MW166_220607**	**7/06/2022**	**Normal**	**EP2206883**	0.02	0.03	0.77	0.20	7.90	<0.02	0.1	0.33	0.30	0.17	0.10	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW171**	**0089_MW171_220607**	**7/06/2022**	**Normal**	**EP2206883**	0.09	0.06	0.24	<0.02	0.03	<0.02	<0.1	0.05	0.14	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW172**	**0089_MW172_220608**	**8/06/2022**	**Normal**	**EP2206971**	1.79	1.32	6.70	1.63	6.47	<0.02	0.6	0.72	3.23	0.28	*0.66*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW173**	**0089_MW173_220608**	**8/06/2022**	**Normal**	**EP2206969**	0.20	0.18	4.53	0.80	8.62	<0.02	<0.1	0.19	0.50	0.09	0.54	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW193**	**0089_MW193_220607**	**7/06/2022**	**Normal**	**EP2206883**	0.61	0.74	8.14	0.52	1.76	<0.02	0.2	0.33	1.50	0.14	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW195D**	**0089_MW195D_220607**	**7/06/2022**	**Normal**	**EP2206883**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	0.08	0.07	0.08	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW195S**	**0089_MW195S_220607**	**7/06/2022**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW195S**	**0089_QC111_220607**	**7/06/2022**	**Field Duplicate**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW195S**	**0089_QC211_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.002	**0.002**	**0.013**	<0.002	0.006	<0.004	<0.008	<0.002	**0.002**	<0.004	**0.012**	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
WWTP	**MW197**	**0089_MW197_220607**	**7/06/2022**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW199**	**0089_MW199_220607**	**7/06/2022**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW199**	**0089_QC109_220607**	**7/06/2022**	**Field Duplicate**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW199**	**0089_QC209_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	0.005	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
WWTP	**MW200**	**0089_MW200_220607**	**7/06/2022**	**Normal**	**EP2206883**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW202**	**0089_MW202_220608**	**8/06/2022**	**Normal**	**EP2206971**	<0.02	<0.02	0.04	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW203**	**0089_MW203_220607**	**7/06/2022**	**Normal**	**EP2206880**	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW203**	**0089_QC115_220607**	**7/06/2022**	**Field Duplicate**	**EP2206880**	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP	**MW203**	**0089_QC215_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	0.009	0.007	0.026	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	0.036	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Helicopter Support Facility	**MW214**	**0089_MW214_220607**	**7/06/2022**	**Normal**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW215**	**0089_MW215_220607**	**7/06/2022**	**Normal**	**EP2206888**	0.14	0.17	0.80	<0.02	<0.01	<0.02	<0.1	0.12	0.42	0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW216**	**0089_MW216_220607**	**7/06/2022**	**Normal**	**EP2206888**	0.39	0.45	3.29	0.16	1.16	<0.02	0.9	3.60	2.23	0.30	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW217**	**0089_MW217_220608**	**8/06/2022**	**Normal**	**EP2206971**	0.02	0.02	0.02	<0.02	0.06	<0.02	1.5	4.56	5.57	0.88	0.38	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW220**	**0089_MW220_220608**	**8/06/2022**	**Normal**	**EP2206971**	0.25	0.18	4.02	0.53	23.5	<0.02	0.2	0.49	0.94	0.19	0.51	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW224**	**0089_MW224_220608**	**8/06/2022**	**Normal**	**EP2206971**	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW225**	**0089_MW225_220607**	**7/06/2022**	**Normal**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW225**	**0089_QC112_220607**	**7/06/2022**	**Field Duplicate**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW225**	**0089_QC212_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Helicopter Support Facility	**MW226**	**0089_MW226_220607**	**7/06/2022**	**Normal**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW227**	**0089_MW227_220607**	**7/06/2022**	**Normal**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW228**	**0089_MW228_220607**	**7/06/2022**	**Normal**	**EP2206888**	0.11	0.08	0.09	<0.02	<0.01	<0.02	1.6	7.48	7.21	1.56	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW233**	**0089_MW233_220608**	**8/06/2022**	**Normal**	**EP2206969**	<0.02	<0.02	0.02	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW236**	**0089_MW236_220607**	**7/06/2022**	**Normal**	**EP2206880**	0.08	0.34	18.1	0.95	84.7	<0.02	<0.1	0.11	0.67	0.36	*1.68*	4.88	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW238**	**0089_MW238_220609**	**9/06/2022**	**Normal**	**EP2207028**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW239**	**0089_MW239_220609**	**9/06/2022**	**Normal**	**EP2207028**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW240**	**0089_MW240_220609**	**9/06/2022**	**Normal**	**EP2207028**	<0.02	0.24	4.46	0.07	<0.01	<0.02	<0.1	0.02	0.20	0.05	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW242**	**0089_MW242_220608**	**8/06/2022**	**Normal**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW243**	**0089_MW243_220609**	**9/06/2022**	**Normal**	**EP2207028**	<0.02	<0.02	0.03	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW245**	**0089_MW245_220609**	**9/06/2022**	**Normal**	**EP2207028**	<0.02	<0.02	0.04	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW249**	**0089_MW249_220608**	**8/06/2022**	**Normal**	**EP2206969**	<0.02	0.02	0.21	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Station, Flammable/Hazardous Goods	**MW255**	**0089_MW255_220609**	**9/06/2022**	**Normal**	**EP2207028**	<0.05	0.09	1.40	<0.02	0.14	<0.02	<0.1	<0.05	0.10	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Station, Flammable/Hazardous Goods	**MW256**	**0089_MW256_220609**	**9/06/2022**	**Normal**	**EP2207028**	0.51	0.44	3.12	0.39	10.7	<0.02	0.2	0.40	1.32	0.16	0.42	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Station, Flammable/Hazardous Goods	**MW257**	**0089_MW257_220609**	**9/06/2022**	**Normal**	**EP2207028**	<0.02	<0.02	<0.05	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Station, Flammable/Hazardous Goods	**MW258**	**0089_MW258_220608**	**8/06/2022**	**Normal**	**EP2206971**	1.30	0.84	2.35	0.08	2.06	<0.02	0.2	0.43	1.30	0.10	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Station, Flammable/Hazardous Goods	**MW259**	**0089_MW259_220609**	**9/06/2022**	**Normal**	**EP2207028**	<0.02	<0.05	<0.05	<0.02	0.11	<0.02	<0.2	0.16	0.09	<0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge Spoil / Careening Bay	**MW268**	**0089_MW268_220609**	**9/06/2022**	**Normal**	**EP2207028**	0.05	0.07	0.41	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge Spoil / Careening Bay	**MW269**	**0089_MW269_220609**	**9/06/2022**	**Normal**	**EP2207028**	0.05	0.09	0.61	<0.02	0.43	<0.02	<0.1	0.02	0.11	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**MW282**	**0089_MW282_220608**	**8/06/2022**	**Normal**	**EP2206971**	1.30	3.44	23.7	4.29	71.3	<0.02	0.6	1.11	3.72	1.44	*4.10*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
Accomodation Area	**MW288**	**0089_MW288_220608**	**8/06/2022**	**Normal**	**EP2206971**	<0.02	<0.02	0.05	<0.02	2.98	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Accomodation Area	**MW289**	**0089_MW289_220608**	**8/06/2022**	**Normal**	**EP2206969**	0.11	0.13	0.74	0.02	0.34	<0.02	<0.1	0.09	0.25	0.05	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**MW500**	**0089_MW500_220607**	**7/06/2022**	**Normal**	**EP2206880**	0.84	2.01	24.2	2.00	49.3	<0.02	0.3	0.83	4.85	0.64	*1.83*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage and Fuel Farm	**MW516**	**0089_MW516_220608**	**8/06/2022**	**Normal**	**EP2206969**	0.06	0.05	0.90	0.12	10.4	<0.02	<0.1	<0.02	0.11	0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**PW304**	**0089_PW304_220608**	**8/06/2022**	**Normal**	**EP2206973**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW306**	**0089_PW306_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW307**	**0089_PW307_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW308**	**0089_PW308_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW314**	**0089_PW314_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW315**	**0089_PW315_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW315**	**0089_QC104_220607**	**7/06/2022**	**Field Duplicate**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW315**	**0089_QC204_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Helicopter Support Facility	**PW316**	**0089_PW316_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.002	0.002	0.002	0.002	0.004	0.004	0.008	0.002	0.001	0.004	0.001	0.002	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Field ID**	**Date**	**Sample Type**	**Lab Report No.**																	
Demolition Ground	**PW329**	**0089_PW329_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**PW330**	**0089_PW330_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**PW330**	**0089_QC117_220608**	**8/06/2022**	**Field Duplicate**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**PW330**	**0089_QC217_220608**	**8/06/2022**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Demolition Ground	**PW331**	**0089_PW331_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**PW331**	**0089_QC118_220608**	**8/06/2022**	**Field Duplicate**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**PW331**	**0089_QC218_220608**	**8/06/2022**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	0.006	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Fire Training Area	**PW335**	**0089_PW335_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**PW340**	**0089_PW340_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**PW341**	**0089_PW341_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**PW345**	**0089_PW345_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	0.03	<0.02	0.47	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Accomodation Area	**PW346**	**0089_PW346_220608**	**8/06/2022**	**Normal**	**EP2206973**	<0.02	<0.02	0.06	<0.02	0.42	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**PW350**	**0089_PW350_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**PW351**	**0089_PW351_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**PW352**	**0089_PW352_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**PW356**	**0089_PW356_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**PW357**	**0089_PW357_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**PW358**	**0089_PW358_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**PW362**	**0089_PW362_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**PW362**	**0089_QC110_220607**	**7/06/2022**	**Field Duplicate**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**PW362**	**0089_QC210_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.002	<0.002	0.003	<0.002	0.028	<0.004	<0.008	<0.002	<0.001	<0.004	0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Fire Training Area	**PW363**	**0089_PW363_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**PW364**	**0089_PW364_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**PW367**	**0089_PW367_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	0.03	<0.02	0.27	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**PW368**	**0089_PW368_220608**	**8/06/2022**	**Normal**	**EP2206973**	<0.02	<0.02	0.06	<0.02	0.27	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**PW369**	**0089_PW369_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	0.03	<0.02	0.17	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge Spoil / Careening Bay	**PW374**	**0089_PW374_220609**	**9/06/2022**	**Normal**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge Spoil / Careening Bay	**PW375**	**0089_PW375_220609**	**9/06/2022**	**Normal**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge Spoil / Careening Bay	**PW378**	**0089_PW378_220609**	**9/06/2022**	**Normal**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**PW380**	**0089_PW380_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**PW381**	**0089_PW381_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**PW401**	**0089_PW401_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW405**	**0089_PW405_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW407**	**0089_PW407_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW409**	**0089_PW409_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW411**	**0089_PW411_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW413**	**0089_PW413_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**PW415**	**0089_PW415_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**SW130**	**0089_SW130_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**SW132**	**0089_SW132_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**SW134**	**0089_QC108_220607**	**7/06/2022**	**Field Duplicate**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	**SW134**	**0089_QC208_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.002	<0.002	0.003	<0.002	0.027	<0.004	<0.008	<0.002	0.002	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Fire Training Area	**SW134**	**0089_SW134_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW150**	**0089_SW150_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW152**	**0089_SW152_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW154**	**0089_SW154_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	**SW156**	**0089_SW156_220608**	**8/06/2022**	**Normal**	**EP2206970**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**SW305**	**0089_SW305_220608**	**8/06/2022**	**Normal**	**EP2206973**	<0.02	<0.02	0.01	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW309**	**0089_SW309_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW310**	**0089_QC103_220607**	**7/06/2022**	**Field Duplicate**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW310**	**0089_QC203_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Helicopter Support Facility	**SW310**	**0089_SW310_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW311**	**0089_SW311_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge Spoil / Careening Bay	**SW317**	**0089_SW317_220609**	**9/06/2022**	**Normal**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge Spoil / Careening Bay	**SW318**	**0089_SW318_220609**	**9/06/2022**	**Normal**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge Spoil / Careening Bay	**SW319**	**0089_SW319_220609**	**9/06/2022**	**Normal**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**SW353**	**0089_SW353_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**SW370**	**0089_SW370_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	0.02	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**SW371**	**0089_SW371_220608**	**8/06/2022**	**Normal**	**EP2206973**	<0.02	<0.02	0.02	<0.02	0.18	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**SW372**	**0089_SW372_220608**	**8/06/2022**	**Normal**	**EP2206973**	<0.02	<0.02	0.02	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (East)	**SW373**	**0089_SW373_220608**	**8/06/2022**	**Normal**	**EP2206973**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**SW382**	**0089_SW382_220607**	**7/06/2022**	**Normal**	**EP2206881**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**SW383**	**0089_SW383_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
WWTP (West)	**SW384**	**0089_SW384_220607**	**7/06/2022**	**Normal**	**EP2206884**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW406**	**0089_SW406_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW408**	**0089_SW408_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW410**	**0089_SW410_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW412**	**0089_SW412_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW414**	**0089_QC116_220607**	**7/06/2022**	**Field Duplicate**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW414**	**0089_QC216_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Helicopter Support Facility	**SW414**	**0089_SW414_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	**SW416**	**0089_SW416_220607**	**7/06/2022**	**Normal**	**EP2206887**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		Metals				Inorganics								
					4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L
LOR - Limit of Reporting					0.008	0.008	0.002	0.004	0.004	0.004	0.004	0.008	0.004	0.004	0.008	0.002	0.001	1	1	1	1	1	1	1	1	0.01	0.01	1	0.01	1
PFAS NEMP 2020 Drinking Water																*0.07*													
PFAS NEMP 2020 Interim Marine 99%																													
PFAS NEMP 2020 Recreational Water																**2**													
Monitoring Area	**Location Code**	**Field ID**	**Date**	**Sample Type**																										
Fire Training Area	**MW109**	**0089_MW109_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.8***	13.2	113	22	2	60	<1	354	<1	354	10.5	10.1	107	1.73	18
Fire Training Area	**MW109**	**0089_QC107_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.2***	12.5													
Fire Training Area	**MW109**	**0089_QC207_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	0.010	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	***6.3***	8.2													
Fire Training Area	**MW112**	**0089_MW112_220607**	**7/06/2022**	**Normal**	<0.05	0.10	<0.05	<0.05	0.71	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***81.2***	85.7	75	9	<1	13	<1	218	<1	218	5.31	5.05	25	2.53	12
Fire Training Area	**MW112**	**0089_QC105_220607**	**7/06/2022**	**Field Duplicate**	<0.05	0.09	<0.05	<0.05	0.74	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***88.8***	93.3													
Fire Training Area	**MW112**	**0089_QC205_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	0.087	0.013	<0.004	0.46	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	***43***	47													
Fire Training Area	**MW120**	**0089_MW120_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.16***	6.49	79	17	3	31	<1	258	<1	258	6.85	6.77	44	0.64	22
Fire Training Area	**MW121**	**0089_MW121_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.89***	7.19	97	14	2	30	<1	294	<1	294	8.14	7.35	70	5.11	14
Fire Training Area	**MW121**	**0089_QC101_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.12***	7.45													
Fire Training Area	**MW121**	**0089_QC201_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	***4.9***	6.0													
Fire Training Area	**MW123**	**0089_MW123_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.62*	1.61	109	30	5	93	<1	410	<1	410	12.8	12.1	158	2.78	6
Fire Training Area	**MW124**	**0089_MW124_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	431	970	382	6,720	<1	343	<1	343	449	403	14,300	5.34	1,860
Fire Training Area	**MW125**	**0089_MW125_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.98*	1.69	476	1,100	420	7,470	<1	587	<1	587	498	450	15,800	5.03	1,930
Fire Training Area	**MW126**	**0089_MW126_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	436	1,020	369	6,690	<1	546	<1	546	493	406	15,800	9.64	1,740
Fire Training Area	**MW127**	**0089_MW127_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	401	1,010	364	6,550	<1	498	<1	498	453	397	14,400	6.52	1,760
Fire Training Area	**MW128**	**0089_MW128_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.54***	6.68	106	30	5	40	<1	462	<1	462	10.7	9.63	41	5.47	17
Demolition Ground	**MW139**	**0089_MW139_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	208	316	92	1,850	<1	312	<1	312	129	119	4,020	3.93	448
Demolition Ground	**MW141**	**0089_MW141_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***53.6***	64.8	410	863	318	5,840	<1	383	<1	383	322	354	10,100	4.63	1,430
Demolition Ground	**MW142**	**0089_MW142_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.87***	4.88	395	990	378	6,920	<1	297	<1	297	405	412	12,800	0.88	1,810
Demolition Ground	**MW149**	**0089_MW149_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	456	1,370	553	9,870	<1	200	<1	200	533	579	16,900	4.16	2,500
WWTP	**MW158**	**0089_MW158_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	210	320	109	2,170	<1	459	<1	459	130	134	3,940	1.67	445
WWTP	**MW161**	**0089_MW161_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.05***	5.83	93	98	39	372	<1	498	<1	498	32.4	29.9	670	3.99	169
WWTP	**MW166**	**0089_MW166_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.67***	9.94	118	90	42	427	<1	388	<1	388	34.6	32.9	828	2.43	167
WWTP	**MW171**	**0089_MW171_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.27*	0.64	210	375	111	2,460	<1	485	<1	485	144	151	4,370	2.41	533
WWTP	**MW172**	**0089_MW172_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.2***	23.4	119	153	64	806	<1	455	<1	455	47.3	55.2	1,190	7.75	222
WWTP	**MW173**	**0089_MW173_220608**	**8/06/2022**	**Normal**	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.2***	15.7	129	105	34	429	<1	464	<1	464	34.5	34.6	803	0.09	126
WWTP	**MW193**	**0089_MW193_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.90***	14.5	111	98	26	282	<1	651	<1	651	29.3	26.5	538	5.03	56
WWTP	**MW195D**	**0089_MW195D_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.26	440	874	340	6,120	<1	168	<1	168	398	369	12,700	3.76	1,730
WWTP	**MW195S**	**0089_MW195S_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	179	137	50	550	<1	612	<1	612	48.0	45.4	1,040	2.81	311
WWTP	**MW195S**	**0089_QC111_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01													
WWTP	**MW195S**	**0089_QC211_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.019	0.035													
WWTP	**MW197**	**0089_MW197_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	78	131	42	610	<1	441	<1	441	44.8	42.3	1,190	2.96	119
WWTP	**MW199**	**0089_MW199_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	115	146	69	1,220	<1	462	<1	462	79.1	72.6	2,300	4.27	238
WWTP	**MW199**	**0089_QC109_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01													
WWTP	**MW199**	**0089_QC209_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.005	0.005													
WWTP	**MW200**	**0089_MW200_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	130	141	91	1,510	<1	484	<1	484	91.2	86.1	2,690	2.90	273
WWTP	**MW202**	**0089_MW202_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	139	44	18	230	<1	382	<1	382	19.8	21.0	367	2.84	90
WWTP	**MW203**	**0089_MW203_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	79	40	6	54	<1	312	<1	312	9.02	9.74	47	3.84	70
WWTP	**MW203**	**0089_QC115_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04													
WWTP	**MW203**	**0089_QC215_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.026	0.078													
Helicopter Support Facility	**MW214**	**0089_MW214_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	231	78	15	447	<1	526	<1	526	38.4	37.8	971	0.77	22
Helicopter Support Facility	**MW215**	**0089_MW215_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.80*	1.70	173	48	14	273	<1	316	<1	316	28.3	24.8	676	6.52	139
Helicopter Support Facility	**MW216**	**0089_MW216_220607**	**7/06/2022**	**Normal**	<0.05	2.95	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.45***	15.7	148	41	7	168	<1	343	<1	343	20.3	18.2	407	5.41	96
Helicopter Support Facility	**MW217**	**0089_MW217_220608**	**8/06/2022**	**Normal**	<0.05	20.7	0.21	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	33.9	129	15	10	40	<1	268	<1	268	7.83	9.67	51	10.5	50
Helicopter Support Facility	**MW220**	**0089_MW220_220608**	**8/06/2022**	**Normal**	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***27.5***	30.9	128	21	13	58	<1	340	<1	340	9.10	11.0	50	9.33	43
Helicopter Support Facility	**MW224**	**0089_MW224_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	67	25	5	95	<1	242	<1	242	8.88	9.66	113	4.23	41
Helicopter Support Facility	**MW225**	**0089_MW225_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	140	42	9	218	<1	319	<1	319	21.7	20.2	503	3.71	55
Helicopter Support Facility	**MW225**	**0089_QC112_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01													
Helicopter Support Facility	**MW225**	**0089_QC212_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	<0.002	<0.001													
Helicopter Support Facility	**MW226**	**0089_MW226_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	477	1,290	508	8,880	<1	644	<1	644	446	529	13,700	8.49	2,260
Helicopter Support Facility	**MW227**	**0089_MW227_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	157	106	45	644	<1	503	<1	503	51.9	45.7	1,260	6.31	302
Helicopter Support Facility	**MW228**	**0089_MW228_220607**	**7/06/2022**	**Normal**	<0.05	0.19	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	18.3	209	490	172	3,680	<1	515	<1	515	243	215	7,410	5.99	1,120
AVCAT Storage and Fuel Farm	**MW233**	**0089_MW233_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.12*	0.12	32	4	2	12	<1	106	<1	106	2.50	2.50	12	0.02	2
AVCAT Storage and Fuel Farm	**MW236**	**0089_MW236_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***103***	112	85	13	1	22	<1	280	<1	280	6.75	6.29	24	3.50	23
AVCAT Storage and Fuel Farm	**MW238**	**0089_MW238_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	89	18	4	26	<1	208	<1	208	6.82	7.16	39	2.42	75
AVCAT Storage and Fuel Farm	**MW239**	**0089_MW239_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	91	16	3	24	<1	230	<1	230	6.54	6.98	32	3.25	50
AVCAT Storage and Fuel Farm	**MW240**	**0089_MW240_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.46***	5.13	131	16	4	36	<1	252	<1	252	8.20	9.52	68	7.44	60
AVCAT Storage and Fuel Farm	**MW242**	**0089_MW242_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	70	12	2	14	<1	199	<1	199	5.02	5.14	18	1.14	26
AVCAT Storage and Fuel Farm	**MW243**	**0089_MW243_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.27*	0.27	123	20	5	42	<1	285	<1	285	8.82	9.74	76	4.97	47
AVCAT Storage and Fuel Farm	**MW245**	**0089_MW245_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	152	20	8	31	<1	460	<1	460	10.2	10.8	30	2.87	7
AVCAT Storage and Fuel Farm	**MW249**	**0089_MW249_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.24*	0.26	108	48	11	99	<1	444	<1	444	14.3	13.9	151	1.31	56
Fire Station, Flammable/Hazardous Goods	**MW255**	**0089_MW255_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.54*	1.73	97	15	5	55	<1	262	<1	262	8.11	8.60	74	2.88	38
Fire Station, Flammable/Hazardous Goods	**MW256**	**0089_MW256_220609**	**9/06/2022**	**Normal**	<0.05	0.16	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.8***	17.9	174	75	8	253	<1	516	<1	516	27.8	26.1	585	3.28	49
Fire Station, Flammable/Hazardous Goods	**MW257**	**0089_MW257_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	66	9	3	18	<1	368	<1	368	8.18	4.89	19	25.1	14
Fire Station, Flammable/Hazardous Goods	**MW258**	**0089_MW258_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.41***	8.72	130	33	14	72	<1	353	<1	353	11.1	12.7	80	6.51	88
Fire Station, Flammable/Hazardous Goods	**MW259**	**0089_MW259_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.36	57	14	1	14	<1	186	<1	186	4.72	4.63	26	0.95	13
Dredge Spoil / Careening Bay	**MW268**	**0089_MW268_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.41*	0.58	214	285	103	1,680	<1	463	<1	463	109	110	3,010	0.26	726
Dredge Spoil / Careening Bay	**MW269**	**0089_MW269_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.04*	1.32	76	67	16	186	<1	419	<1	419	19.1	17.8	303	3.41	103
Helicopter Support Facility	**MW282**	**0089_MW282_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***95.0***	115	211	26	<1	41	<1	535	<1	535	12.5	14.4	54	7.06	16
Accomodation Area	**MW288**	**0089_MW288_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.03***	3.05	121	24	5	40	<1	271	<1	271	7.85	9.88	54	11.4	44
Accomodation Area	**MW289**	**0089_MW289_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.08*	1.78	135	28	5	83	<1	396	<1	396	12.2	12.8	99	2.47	70
Fire Training Area	**MW500**	**0089_MW500_220607**	**7/06/2022**	**Normal**	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***73.5***	86.9	136	17	3	23	<1	408	<1	408	9.92	9.26	40	3.45	31
AVCAT Storage and Fuel Farm	**MW516**	**0089_MW516_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***11.3***	11.7	130	52	16	104	<1	483	<1	483	15.2	15.7	143	1.74	71
WWTP (East)	**PW304**	**0089_PW304_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	452	1,360	542	9,700	<1	285	<1	285	548	570	17,300	1.99	2,610
Helicopter Support Facility	**PW306**	**0089_PW306_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	541	1,410	607	10,200	<1	629	<1	629	616	602	19,300	1.09	2,810
Helicopter Support Facility	**PW307**	**0089_PW307_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	442	1,420	555	10,500	<1	137	<1	137	538	610	17,100	6.26	2,540
Helicopter Support Facility	**PW308**	**0089_PW308_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	439	1,430	557	10,400	<1	132	<1	132	520	606	16,400	7.69	2,610
Helicopter Support Facility	**PW314**	**0089_PW314_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	452	1,380	576	10,200	<1	158	<1	158	599	594	19,000	0.40	2,890
Helicopter Support Facility	**PW315**	**0089_PW315_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	488	1,500	582	11,000	<1	200	<1	200	550	641	17,500	7.64	2,520
Helicopter Support Facility	**PW315**	**0089_QC104_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01													
Helicopter Support Facility	**PW315**	**0089_QC204_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	<0.002	<0.001													
Helicopter Support Facility	**PW316**	**0089_PW316_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	458	1,470	571	10,800	<1	139	<1	139	534	628	17,000	8.09	2,490

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		Metals				Inorganics								
					4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L
LOR - Limit of Reporting					0.008	0.008	0.002	0.004	0.004	0.004	0.004	0.008	0.004	0.004	0.008	0.002	0.001	1	1	1	1	1	1	1	1	0.01	0.01	1	0.01	1
PFAS NEMP 2020 Drinking Water																*0.07*													
PFAS NEMP 2020 Interim Marine 99%																													
PFAS NEMP 2020 Recreational Water																**2**													
Monitoring Area	**Location Code**	**Field ID**	**Date**	**Sample Type**																										
Demolition Ground	**PW329**	**0089_PW329_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	509	1,540	624	11,100	<1	245	<1	245	568	651	18,200	6.83	2,370
Demolition Ground	**PW330**	**0089_PW330_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	586	1,580	631	11,400	<1	418	<1	418	586	671	18,600	6.82	2,520
Demolition Ground	**PW330**	**0089_QC117_220608**	**8/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01													
Demolition Ground	**PW330**	**0089_QC217_220608**	**8/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	<0.002	<0.001													
Demolition Ground	**PW331**	**0089_PW331_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	529	1,610	654	11,700	<1	247	<1	247	564	684	17,600	9.63	3,020
Demolition Ground	**PW331**	**0089_QC118_220608**	**8/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01													
Demolition Ground	**PW331**	**0089_QC218_220608**	**8/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.006	0.006													
Fire Training Area	**PW335**	**0089_PW335_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	468	1,310	558	9,690	<1	164	<1	164	625	567	20,200	4.87	2,490
Fire Training Area	**PW340**	**0089_PW340_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	454	1,280	554	9,420	<1	166	<1	166	563	552	18,000	0.97	2,480
Fire Training Area	**PW341**	**0089_PW341_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	454	1,250	554	9,140	<1	178	<1	178	561	537	17,900	2.18	2,530
WWTP (East)	**PW345**	**0089_PW345_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.50*	0.50	473	1,430	594	10,600	<1	131	<1	131	658	618	21,400	3.21	2,510
Accomodation Area	**PW346**	**0089_PW346_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.48*	0.49	531	1,600	647	11,500	<1	313	<1	313	621	675	19,600	4.18	2,960
WWTP (West)	**PW350**	**0089_PW350_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	442	1,350	568	9,950	<1	124	<1	124	565	580	17,900	1.34	2,770
WWTP (West)	**PW351**	**0089_PW351_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	447	1,280	543	9,380	<1	124	<1	124	553	550	17,700	0.33	2,470
WWTP (West)	**PW352**	**0089_PW352_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	427	1,300	535	9,600	<1	125	<1	125	544	560	17,200	1.38	2,720
Demolition Ground	**PW356**	**0089_PW356_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	528	1,610	656	11,800	<1	235	<1	235	572	689	18,200	9.25	2,600
Demolition Ground	**PW357**	**0089_PW357_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	505	1,530	619	11,100	<1	275	<1	275	554	650	17,600	7.94	2,510
Demolition Ground	**PW358**	**0089_PW358_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	514	1,550	623	11,300	<1	245	<1	245	555	661	17,600	8.70	2,570
Fire Training Area	**PW362**	**0089_PW362_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	456	1,290	553	9,590	<1	156	<1	156	560	560	17,800	0.02	2,630
Fire Training Area	**PW362**	**0089_QC110_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03													
Fire Training Area	**PW362**	**0089_QC210_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.031	0.033													
Fire Training Area	**PW363**	**0089_PW363_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	462	1,320	566	9,750	<1	128	<1	128	556	570	17,800	1.22	2,490
Fire Training Area	**PW364**	**0089_PW364_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	490	1,380	587	10,100	<1	148	<1	148	569	592	18,200	2.01	2,530
WWTP (East)	**PW367**	**0089_PW367_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.30*	0.30	459	1,370	567	10,300	<1	129	<1	129	582	598	18,600	1.39	2,620
WWTP (East)	**PW368**	**0089_PW368_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.33*	0.33	489	1,590	639	11,600	<1	128	<1	128	601	676	19,100	5.91	2,850
WWTP (East)	**PW369**	**0089_PW369_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.20*	0.20	479	1,470	602	10,800	<1	139	<1	139	580	630	18,600	4.16	2,510
Dredge Spoil / Careening Bay	**PW374**	**0089_PW374_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	455	1,480	595	10,800	<1	122	<1	122	528	630	16,800	8.81	2,460
Dredge Spoil / Careening Bay	**PW375**	**0089_PW375_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	456	1,480	593	10,800	<1	122	<1	122	627	630	20,300	0.22	2,480
Dredge Spoil / Careening Bay	**PW378**	**0089_PW378_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	447	1,450	581	10,600	<1	122	<1	122	550	618	17,600	5.74	2,480
WWTP (West)	**PW380**	**0089_PW380_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	467	1,340	580	9,830	<1	132	<1	132	569	576	18,200	0.64	2,530
WWTP (West)	**PW381**	**0089_PW381_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	481	1,480	615	11,000	<1	124	<1	124	550	640	17,600	7.59	2,440
WWTP (West)	**PW401**	**0089_PW401_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	469	1,330	568	9,880	<1	124	<1	124	555	577	17,700	1.97	2,550
Helicopter Support Facility	**PW405**	**0089_PW405_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	505	1,640	644	12,100	<1	130	<1	130	599	703	19,200	7.97	2,640
Helicopter Support Facility	**PW407**	**0089_PW407_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	416	1,320	517	9,700	<1	195	<1	195	477	564	15,000	8.40	2,400
Helicopter Support Facility	**PW409**	**0089_PW409_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	496	1,590	631	11,800	<1	155	<1	155	562	685	17,800	9.86	2,730
Helicopter Support Facility	**PW411**	**0089_PW411_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	464	1,500	577	11,000	<1	136	<1	136	536	640	17,100	8.86	2,430
Helicopter Support Facility	**PW413**	**0089_PW413_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	441	1,420	554	10,400	<1	128	<1	128	545	605	17,400	5.25	2,480
Helicopter Support Facility	**PW415**	**0089_PW415_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	447	1,450	561	10,600	<1	142	<1	142	572	617	18,300	3.80	2,540
Fire Training Area	**SW130**	**0089_SW130_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	435	1,250	544	9,290	<1	123	<1	123	562	542	18,000	1.72	2,470
Fire Training Area	**SW132**	**0089_SW132_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	442	1,270	546	9,390	<1	130	<1	130	574	549	18,400	2.20	2,500
Fire Training Area	**SW134**	**0089_QC108_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01													
Fire Training Area	**SW134**	**0089_QC208_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.031	0.033													
Fire Training Area	**SW134**	**0089_SW134_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	457	1,310	561	9,630	<1	128	<1	128	579	564	18,600	1.33	2,490
Demolition Ground	**SW150**	**0089_SW150_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	459	1,510	603	11,000	<1	130	<1	130	554	641	17,500	7.29	2,770
Demolition Ground	**SW152**	**0089_SW152_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	472	1,540	616	11,200	<1	125	<1	125	551	653	17,700	8.51	2,350
Demolition Ground	**SW154**	**0089_SW154_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	460	1,500	602	10,900	<1	125	<1	125	531	636	16,800	9.00	2,620
Demolition Ground	**SW156**	**0089_SW156_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	450	1,460	586	10,700	<1	123	<1	123	559	623	18,000	5.38	2,360
WWTP (East)	**SW305**	**0089_SW305_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.23*	0.23	492	1,600	642	11,700	<1	127	<1	127	604	682	19,300	6.00	2,760
Helicopter Support Facility	**SW309**	**0089_SW309_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	445	1,440	560	10,600	<1	123	<1	123	531	616	16,900	7.44	2,480
Helicopter Support Facility	**SW310**	**0089_QC103_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01													
Helicopter Support Facility	**SW310**	**0089_QC203_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.004	0.004													
Helicopter Support Facility	**SW310**	**0089_SW310_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	444	1,440	559	10,600	<1	122	<1	122	536	616	17,100	6.94	2,460
Helicopter Support Facility	**SW311**	**0089_SW311_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	439	1,420	555	10,400	<1	116	<1	116	551	605	17,600	4.68	2,520
Dredge Spoil / Careening Bay	**SW317**	**0089_SW317_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	484	1,580	635	11,500	<1	123	<1	123	554	671	17,700	9.49	2,530
Dredge Spoil / Careening Bay	**SW318**	**0089_SW318_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	459	1,490	599	10,900	<1	124	<1	124	548	635	17,500	7.34	2,500
Dredge Spoil / Careening Bay	**SW319**	**0089_SW319_220609**	**9/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	453	1,480	593	10,700	<1	122	<1	122	564	625	17,900	5.13	2,720
WWTP (West)	**SW353**	**0089_SW353_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	490	1,500	624	11,000	<1	125	<1	125	528	642	16,800	9.78	2,470
WWTP (East)	**SW370**	**0089_SW370_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.13*	0.13	444	1,350	555	10,000	<1	126	<1	126	565	582	18,100	1.54	2,480
WWTP (East)	**SW371**	**0089_SW371_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.20*	0.20	477	1,550	624	11,300	<1	132	<1	132	602	659	19,200	4.50	2,780
WWTP (East)	**SW372**	**0089_SW372_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.11	483	1,580	636	11,500	<1	121	<1	121	596	671	18,900	5.90	2,900
WWTP (East)	**SW373**	**0089_SW373_220608**	**8/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	478	1,560	627	11,400	<1	121	<1	121	592	664	18,800	5.72	2,860
WWTP (West)	**SW382**	**0089_SW382_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	458	1,310	567	9,730	<1	123	<1	123	558	568	17,900	0.90	2,440
WWTP (West)	**SW383**	**0089_SW383_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	485	1,490	620	11,000	<1	124	<1	124	548	641	17,400	7.79	2,650
WWTP (West)	**SW384**	**0089_SW384_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	452	1,400	581	10,400	<1	123	<1	123	605	605	19,200	0.03	2,910
Helicopter Support Facility	**SW406**	**0089_SW406_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	445	1,380	575	10,200	<1	122	<1	122	604	594	19,200	0.86	2,900
Helicopter Support Facility	**SW408**	**0089_SW408_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	458	1,460	575	10,800	<1	124	<1	124	548	627	17,300	6.73	2,780
Helicopter Support Facility	**SW410**	**0089_SW410_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	460	1,500	585	11,000	<1	120	<1	120	561	640	17,900	6.56	2,580
Helicopter Support Facility	**SW412**	**0089_SW412_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	443	1,440	560	10,600	<1	122	<1	122	540	616	17,200	6.55	2,530
Helicopter Support Facility	**SW414**	**0089_QC116_220607**	**7/06/2022**	**Field Duplicate**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01													
Helicopter Support Facility	**SW414**	**0089_QC216_220607**	**7/06/2022**	**Interlab Duplicate**	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	<0.002	<0.001													
Helicopter Support Facility	**SW414**	**0089_SW414_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	434	1,410	546	10,300	<1	120	<1	120	547	600	17,300	4.63	2,700
Helicopter Support Facility	**SW416**	**0089_SW416_220607**	**7/06/2022**	**Normal**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	453	1,480	573	10,700	<1	123	<1	123	559	624	17,800	5.56	2,600

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2020 Ecological direct exposure										1						10						
PFAS NEMP 2020 Ecological indirect exposure										*0.01*												
PFAS NEMP 2020 Industrial/ commercial (HIL D)																**50**						
Monitoring Area	**Location ID**	**Field ID**	**Date**	**Sample Type**	**Lab Report No.**																	
WWTP	**SD304**	**0089_SD304_220608**	**8/06/2022**	**Normal**	**EP2206972**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD306**	**0089_SD306_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD307**	**0089_SD307_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD308**	**0089_SD308_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD314**	**0089_QC102_220607**	**7/06/2022**	**Field Duplicate**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD314**	**0089_QC202_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD314**	**0089_SD314_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD315**	**0089_SD315_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD316**	**0089_SD316_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD329**	**0089_SD329_220608**	**8/06/2022**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD330**	**0089_SD330_220608**	**8/06/2022**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD331**	**0089_SD331_220608**	**8/06/2022**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD335**	**0089_QC113_220607**	**7/06/2022**	**Field Duplicate**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD335**	**0089_QC213_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD335**	**0089_SD335_220607**	**7/06/2022**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD340**	**0089_SD340_220607**	**7/06/2022**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD341**	**0089_SD341_220607**	**7/06/2022**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD345**	**0089_SD345_220607**	**7/06/2022**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accomodation Area	**SD346**	**0089_SD346_220608**	**8/06/2022**	**Normal**	**EP2206972**	<0.0002	<0.0002	<0.0002	<0.0002	0.0019	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD350**	**0089_SD350_220607**	**7/06/2022**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD351**	**0089_SD351_220607**	**7/06/2022**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD352**	**0089_SD352_220607**	**7/06/2022**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD356**	**0089_SD356_220608**	**8/06/2022**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD357**	**0089_SD357_220608**	**8/06/2022**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	**SD358**	**0089_SD358_220608**	**8/06/2022**	**Normal**	**EP2206968**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD362**	**0089_SD362_220607**	**7/06/2022**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD363**	**0089_SD363_220607**	**7/06/2022**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Fire Training Area	**SD364**	**0089_SD364_220607**	**7/06/2022**	**Normal**	**EP2206882**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD367**	**0089_SD367_220607**	**7/06/2022**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD368**	**0089_SD368_220608**	**8/06/2022**	**Normal**	**EP2206972**	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD369**	**0089_QC106_220607**	**7/06/2022**	**Field Duplicate**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	0.0019	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD369**	**0089_QC206_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD369**	**0089_SD369_220607**	**7/06/2022**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	0.0021	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil / Careening Bay	**SD374**	**0089_SD374_220609**	**9/06/2022**	**Normal**	**EP2207027**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil / Careening Bay	**SD375**	**0089_SD375_220609**	**9/06/2022**	**Normal**	**EP2207027**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil / Careening Bay	**SD378**	**0089_SD378_220609**	**9/06/2022**	**Normal**	**EP2207027**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD380**	**0089_SD380_220607**	**7/06/2022**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD381**	**0089_SD381_220607**	**7/06/2022**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	**SD401**	**0089_SD401_220607**	**7/06/2022**	**Normal**	**EP2206885**	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD405**	**0089_SD405_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD407**	**0089_QC114_220607**	**7/06/2022**	**Field Duplicate**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD407**	**0089_QC214_220607**	**7/06/2022**	**Interlab Duplicate**	**896805**	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD407**	**0089_SD407_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD409**	**0089_SD409_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD411**	**0089_SD411_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD413**	**0089_SD413_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Helicopter Support Facility	**SD415**	**0089_SD415_220607**	**7/06/2022**	**Normal**	**EP2206886**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:

First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0005	0.0005	0.0005	0.0005	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
PFAS NEMP 2020 Ecological direct exposure																		
PFAS NEMP 2020 Ecological indirect exposure																		
PFAS NEMP 2020 Industrial/ commercial (HIL D)																**20**		
Monitoring Area	**Location ID**	**Field ID**	**Date**	**Sample Type**														
WWTP	**SD304**	**0089_SD304_220608**	**8/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD306**	**0089_SD306_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD307**	**0089_SD307_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD308**	**0089_SD308_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD314**	**0089_QC102_220607**	**7/06/2022**	**Field Duplicate**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD314**	**0089_QC202_220607**	**7/06/2022**	**Interlab Duplicate**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
Helicopter Support Facility	**SD314**	**0089_SD314_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD315**	**0089_SD315_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD316**	**0089_SD316_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD329**	**0089_SD329_220608**	**8/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD330**	**0089_SD330_220608**	**8/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD331**	**0089_SD331_220608**	**8/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD335**	**0089_QC113_220607**	**7/06/2022**	**Field Duplicate**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Fire Training Area	**SD335**	**0089_QC213_220607**	**7/06/2022**	**Interlab Duplicate**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
Fire Training Area	**SD335**	**0089_SD335_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Fire Training Area	**SD340**	**0089_SD340_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Fire Training Area	**SD341**	**0089_SD341_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**0089_SD345_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0007	0.0007	0.0007
Accomodation Area	**SD346**	**0089_SD346_220608**	**8/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0019	0.0019	0.0019
WWTP	**SD350**	**0089_SD350_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
WWTP	**SD351**	**0089_SD351_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**0089_SD352_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD356**	**0089_SD356_220608**	**8/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD357**	**0089_SD357_220608**	**8/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD358**	**0089_SD358_220608**	**8/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD362**	**0089_SD362_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD363**	**0089_SD363_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD364**	**0089_SD364_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD367**	**0089_SD367_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0008	0.0008	0.0008
WWTP	**SD368**	**0089_SD368_220608**	**8/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
WWTP	**SD369**	**0089_QC106_220607**	**7/06/2022**	**Field Duplicate**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0019	0.0019	0.0019
WWTP	**SD369**	**0089_QC206_220607**	**7/06/2022**	**Interlab Duplicate**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
WWTP	**SD369**	**0089_SD369_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0021	0.0021	0.0021
Dredge spoil / Careening Bay	**SD374**	**0089_SD374_220609**	**9/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil / Careening Bay	**SD375**	**0089_SD375_220609**	**9/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil / Careening Bay	**SD378**	**0089_SD378_220609**	**9/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
WWTP	**SD380**	**0089_SD380_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD381**	**0089_SD381_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD401**	**0089_SD401_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Helicopter Support Facility	**SD405**	**0089_SD405_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD407**	**0089_QC114_220607**	**7/06/2022**	**Field Duplicate**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD407**	**0089_QC214_220607**	**7/06/2022**	**Interlab Duplicate**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
Helicopter Support Facility	**SD407**	**0089_SD407_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD409**	**0089_SD409_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD411**	**0089_SD411_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD413**	**0089_SD413_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	**SD415**	**0089_SD415_220607**	**7/06/2022**	**Normal**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:

First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

				PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
				Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.05
Field ID	**Date**	**Sample Type**	**Lab Report No.**																	
0089_QC301_220607	**7/06/2022**	**Rinsate**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC301_220608	**8/06/2022**	**Rinsate**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC301_220609	**9/06/2022**	**Rinsate**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC302_220607	**7/06/2022**	**Rinsate**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC302_220608	**8/06/2022**	**Rinsate**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC302_220609	**9/06/2022**	**Rinsate**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC303_220607	**7/06/2022**	**Rinsate**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC401_220607	**7/06/2022**	**Field Blank**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC401_220608	**8/06/2022**	**Field Blank**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC401_220609	**9/06/2022**	**Field Blank**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC402_220607	**7/06/2022**	**Field Blank**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC402_220608	**8/06/2022**	**Field Blank**	**EP2206969**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC402_220609	**9/06/2022**	**Field Blank**	**EP2207029**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
0089_QC403_220607	**7/06/2022**	**Field Blank**	**EP2206888**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

	PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS	
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01
Field ID	**Date**	**Sample Type**	**Lab Report No.**										
0089_QC301_220607	**7/06/2022**	**Rinsate**	**EP2206888**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC301_220608	**8/06/2022**	**Rinsate**	**EP2206969**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC301_220609	**9/06/2022**	**Rinsate**	**EP2207029**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC302_220607	**7/06/2022**	**Rinsate**	**EP2206888**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC302_220608	**8/06/2022**	**Rinsate**	**EP2206969**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC302_220609	**9/06/2022**	**Rinsate**	**EP2207029**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC303_220607	**7/06/2022**	**Rinsate**	**EP2206888**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC401_220607	**7/06/2022**	**Field Blank**	**EP2206888**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC401_220608	**8/06/2022**	**Field Blank**	**EP2206969**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC401_220609	**9/06/2022**	**Field Blank**	**EP2207029**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC402_220607	**7/06/2022**	**Field Blank**	**EP2206888**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC402_220608	**8/06/2022**	**Field Blank**	**EP2206969**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC402_220609	**9/06/2022**	**Field Blank**	**EP2207029**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
0089_QC403_220607	**7/06/2022**	**Field Blank**	**EP2206888**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01

			Field ID	0089_MW121_220607	0089_QC101_220607		0089_MW121_220607	0089_QC201_220607		0089_PW315_220607	0089_QC104_220607		0089_PW315_220607	0089_QC204_220607	
			Date	7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2206880	EP2206880	RPD	EP2206880	896805	RPD	EP2206887	EP2206887	RPD	EP2206887	896805	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002		0.05	0.05	0	0.05	0.046	8	<0.02	<0.02	0	<0.02	<0.002	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002		0.16	0.16	0	0.16	0.11	**37**	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002		5.30	5.40	2	5.30	4.4	19	<0.01	<0.01	0	<0.01	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002		0.22	0.27	20	0.22	0.17	**26**	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.004		0.59	0.72	20	0.59	0.45	**27**	<0.01	<0.01	0	<0.01	<0.004	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.008		<0.1	<0.1	0	<0.1	0.047	0	<0.1	<0.1	0	<0.1	<0.008	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002		0.13	0.12	8	0.13	0.087	**40**	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.001		0.46	0.45	2	0.46	0.41	11	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.004		0.08	0.08	0	0.08	0.070	13	<0.02	<0.02	0	<0.02	<0.004	0
Perfluorooctanoic acid (PFOA)	µg/L	0.001		0.20	0.20	0	0.20	0.16	**22**	<0.01	<0.01	0	<0.01	<0.001	0
Perfluorononanoic acid (PFNA)	µg/L	0.002		<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorodecanoic acid (PFDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001		<0.05	<0.05	0	<0.05	<0.001	0	<0.05	<0.05	0	<0.05	<0.001	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.002		<0.05	<0.05	0	<0.05	<0.002	0	<0.05	<0.05	0	<0.05	<0.002	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.004		<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.004		<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.004		<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
Perfluorooctane sulfonamidoacetic acid (FOSAA)	µg/L	0.002						<0.002						<0.002	
PFAS															
Sum of PFHxS and PFOS	µg/L	0.002		5.89	6.12	4	5.89	4.9	18	<0.01	<0.01	0	<0.01	<0.002	0
Sum of PFAS	µg/L	0.001		7.19	7.45	4	7.19	6.0	18	<0.01	<0.01	0	<0.01	<0.001	0

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))**

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

			Field ID	0089_SW310_220607	0089_QC103_220607		0089_SW310_220607	0089_QC203_220607		0089_MW112_220607	0089_QC105_220607		0089_MW112_220607	0089_QC205_220607	
			Date	7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2206887	EP2206887	RPD	EP2206887	896805	RPD	EP2206880	EP2206880	RPD	EP2206880	896805	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002		<0.02	<0.02	0	<0.02	<0.002	0	0.02	0.02	0	0.02	0.027	30
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002		<0.02	<0.02	0	<0.02	<0.002	0	0.13	0.15	14	0.13	0.15	14
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002		<0.01	<0.01	0	<0.01	<0.002	0	7.64	8.02	5	7.64	3.0	**87**
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002		<0.02	<0.02	0	<0.02	<0.002	0	1.52	1.43	6	1.52	0.73	**70**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.004		<0.01	<0.01	0	<0.01	0.004	0	73.6	80.8	9	73.6	6.7	**167**
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.008		<0.1	<0.1	0	<0.1	<0.008	0	<0.1	<0.1	0	<0.1	0.045	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002		<0.02	<0.02	0	<0.02	<0.002	0	0.12	0.12	0	0.12	0.098	20
Perfluorohexanoic acid (PFHxA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	0.59	0.60	2	0.59	0.68	14
Perfluoroheptanoic acid (PFHpA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	0.23	0.25	8	0.23	0.19	19
Perfluorooctanoic acid (PFOA)	µg/L	0.001		<0.01	<0.01	0	<0.01	<0.001	0	0.99	1.00	1	0.99	1.1	11
Perfluorononanoic acid (PFNA)	µg/L	0.002		<0.02	<0.02	0	<0.02	<0.002	0	0.08	0.08	0	0.08	0.071	12
Perfluorodecanoic acid (PFDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	0.006	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001		<0.05	<0.05	0	<0.05	<0.001	0	<0.05	<0.05	0	<0.05	<0.001	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	0.10	0.09	11	0.10	0.087	14
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.002		<0.05	<0.05	0	<0.05	<0.002	0	<0.05	<0.05	0	<0.05	0.013	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.004		<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	0.71	0.74	4	0.71	0.46	**43**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.004		<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.004		<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
Perfluorooctane sulfonamidoacetic acid (FOSAA)	µg/L	0.002						<0.002						0.006	
PFAS															
Sum of PFHxS and PFOS	µg/L	0.002		<0.01	<0.01	0	<0.01	0.004	0	81.2	88.8	9	81.2	43	**62**
Sum of PFAS	µg/L	0.001		<0.01	<0.01	0	<0.01	0.004	0	85.7	93.3	8	85.7	47	**58**

			Field ID	0089_MW109_220607	0089_QC107_220607		0089_MW109_220607	0089_QC207_220607		0089_SW134_220607	0089_QC108_220607		0089_SW134_220607	0089_QC208_220607	
			Date	7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2206880	EP2206880	RPD	EP2206880	896805	RPD	EP2206881	EP2206881	RPD	EP2206881	896805	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002		0.14	0.15	7	0.14	0.14	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002		0.36	0.35	3	0.36	0.29	**22**	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002		6.15	5.70	8	6.15	4.0	**42**	<0.01	<0.01	0	<0.01	0.003	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002		0.52	0.50	4	0.52	0.38	**31**	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.004		4.64	4.47	4	4.64	2.3	**67**	0.02	0.01	67	0.02	0.027	30
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.008		<0.1	<0.1	0	<0.1	0.085	0	<0.1	<0.1	0	<0.1	<0.008	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002		0.15	0.16	6	0.15	0.12	**22**	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.001		0.81	0.81	0	0.81	0.63	**25**	<0.02	<0.02	0	<0.02	0.002	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.004		0.09	0.08	12	0.09	0.078	14	<0.02	<0.02	0	<0.02	<0.004	0
Perfluorooctanoic acid (PFOA)	µg/L	0.001		0.29	0.28	4	0.29	0.22	**27**	<0.01	<0.01	0	<0.01	<0.001	0
Perfluorononanoic acid (PFNA)	µg/L	0.002		<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorodecanoic acid (PFDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001		<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001		<0.05	<0.05	0	<0.05	<0.001	0	<0.05	<0.05	0	<0.05	<0.001	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.008		<0.05	<0.05	0	<0.05	0.010	0	<0.05	<0.05	0	<0.05	<0.008	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.002		<0.05	<0.05	0	<0.05	<0.002	0	<0.05	<0.05	0	<0.05	<0.002	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.004		<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.004		<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.004		<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.004		<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.008		<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
Perfluorooctane sulfonamidoacetic acid (FOSAA)	µg/L	0.002						<0.002						<0.002	
PFAS															
Sum of PFHxS and PFOS	µg/L	0.002		10.8	10.2	6	10.8	6.3	**53**	0.02	0.01	67	0.02	0.031	43
Sum of PFAS	µg/L	0.001		13.2	12.5	5	13.2	8.2	**47**	0.02	0.01	67	0.02	0.033	**49**

	Field ID		0089_MW199_220607	0089_QC109_220607		0089_MW199_220607	0089_QC209_220607		0089_PW362_220607	0089_QC110_220607		0089_PW362_220607	0089_QC210_220607	
	Date		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022	
	Matrix Type		Water	Water		Water	Water		Water	Water		Water	Water	
	Lab Report Number		EP2206883	EP2206883	RPD	EP2206883	896805	RPD	EP2206881	EP2206881	RPD	EP2206881	896805	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002	<0.01	<0.01	0	<0.01	<0.002	0	<0.01	<0.01	0	<0.01	0.003	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.004	<0.01	<0.01	0	<0.01	0.005	0	0.04	0.03	29	0.04	0.028	35
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	µg/L	0.008	<0.1	<0.1	0	<0.1	<0.008	0	<0.1	<0.1	0	<0.1	<0.008	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
Perfluorooctanoic acid (PFOA)	µg/L	0.001	<0.01	<0.01	0	<0.01	<0.001	0	<0.01	<0.01	0	<0.01	0.001	0
Perfluorononanoic acid (PFNA)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorodecanoic acid (PFDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001	<0.05	<0.05	0	<0.05	<0.001	0	<0.05	<0.05	0	<0.05	<0.001	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.002	<0.05	<0.05	0	<0.05	<0.002	0	<0.05	<0.05	0	<0.05	<0.002	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
Perfluorooctane sulfonamidoacetic acid (FOSAA)	µg/L	0.002					<0.002						<0.002	
PFAS														
Sum of PFHxS and PFOS	µg/L	0.002	<0.01	<0.01	0	<0.01	0.005	0	0.04	0.03	29	0.04	0.031	25
Sum of PFAS	µg/L	0.001	<0.01	<0.01	0	<0.01	0.005	0	0.04	0.03	29	0.04	0.033	19

	Field ID	0089_MW195S_220607	0089_QC111_220607		0089_MW195S_220607	0089_QC211_220607		0089_MW225_220607	0089_QC112_220607		0089_MW225_220607	0089_QC212_220607	
	Date	7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022	
	Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
	Lab Report Number	EP2206883	EP2206883	RPD	EP2206883	896805	RPD	EP2206888	EP2206888	RPD	EP2206888	896805	RPD
	Unit	LOR											
PFAS - Perfluoroalkyl Sulfonic Acids													
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002	<0.02	<0.02	0	<0.02	0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002	<0.01	<0.01	0	<0.01	0.013	26	<0.01	<0.01	0	<0.01	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.004	<0.01	<0.01	0	<0.01	0.006	0	<0.01	<0.01	0	<0.01	<0.004	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	µg/L	0.008	<0.1	<0.1	0	<0.1	<0.008	0	<0.1	<0.1	0	<0.1	<0.008	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.001	<0.02	<0.02	0	<0.02	0.002	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
Perfluorooctanoic acid (PFOA)	µg/L	0.001	<0.01	<0.01	0	<0.01	0.012	18	<0.01	<0.01	0	<0.01	<0.001	0
Perfluorononanoic acid (PFNA)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorodecanoic acid (PFDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001	<0.05	<0.05	0	<0.05	<0.001	0	<0.05	<0.05	0	<0.05	<0.001	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.002	<0.05	<0.05	0	<0.05	<0.002	0	<0.05	<0.05	0	<0.05	<0.002	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
Perfluorooctane sulfonamidoacetic acid (FOSAA)	µg/L	0.002					<0.002						<0.002	
PFAS														
Sum of PFHxS and PFOS	µg/L	0.002	<0.01	<0.01	0	<0.01	0.019	62	<0.01	<0.01	0	<0.01	<0.002	0
Sum of PFAS	µg/L	0.001	<0.01	<0.01	0	<0.01	0.035	111	<0.01	<0.01	0	<0.01	<0.001	0

	Field ID	0089_MW203_220607	0089_QC115_220607		0089_MW203_220607	0089_QC215_220607		0089_SW414_220607	0089_QC116_220607		0089_SW414_220607	0089_QC216_220607	
	Date	7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022	
	Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
	Lab Report Number	EP2206880	EP2206880	RPD	EP2206880	896805	RPD	EP2206887	EP2206887	RPD	EP2206887	896805	RPD
	Unit	LOR											
PFAS - Perfluoroalkyl Sulfonic Acids													
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002	<0.02	<0.02	0	<0.02	0.009	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002	<0.02	<0.02	0	<0.02	0.007	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002	0.04	0.04	0	0.04	0.026	42	<0.01	<0.01	0	<0.01	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.004	<0.01	<0.01	0	<0.01	<0.004	0	<0.01	<0.01	0	<0.01	<0.004	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	µg/L	0.008	<0.1	<0.1	0	<0.1	<0.008	0	<0.1	<0.1	0	<0.1	<0.008	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.004	<0.02	<0.02	0	<0.02	0.036	57	<0.02	<0.02	0	<0.02	<0.004	0
Perfluorooctanoic acid (PFOA)	µg/L	0.001	<0.01	<0.01	0	<0.01	<0.001	0	<0.01	<0.01	0	<0.01	<0.001	0
Perfluorononanoic acid (PFNA)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorodecanoic acid (PFDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001	<0.05	<0.05	0	<0.05	<0.001	0	<0.05	<0.05	0	<0.05	<0.001	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.002	<0.05	<0.05	0	<0.05	<0.002	0	<0.05	<0.05	0	<0.05	<0.002	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
Perfluorooctane sulfonamidoacetic acid (FOSAA)	µg/L	0.002					<0.002						<0.002	
PFAS														
Sum of PFHxS and PFOS	µg/L	0.002	0.04	0.04	0	0.04	0.026	42	<0.01	<0.01	0	<0.01	<0.002	0
Sum of PFAS	µg/L	0.001	0.04	0.04	0	0.04	0.078	64	<0.01	<0.01	0	<0.01	<0.001	0

Field ID			0089_PW330_220608	0089_QC117_220608		0089_PW330_220608	0089_QC217_220608		0089_PW331_220608	0089_QC118_220608		0089_PW331_220608	0089_QC218_220608	
Date			8/06/2022	8/06/2022		8/06/2022	8/06/2022		8/06/2022	8/06/2022		8/06/2022	8/06/2022	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2206970	EP2206970	RPD	EP2206970	896805	RPD	EP2206970	EP2206970	RPD	EP2206970	896805	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002	<0.01	<0.01	0	<0.01	<0.002	0	<0.01	<0.01	0	<0.01	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.004	<0.01	<0.01	0	<0.01	<0.004	0	<0.01	<0.01	0	<0.01	0.006	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	µg/L	0.008	<0.1	<0.1	0	<0.1	<0.008	0	<0.1	<0.1	0	<0.1	<0.008	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
Perfluorooctanoic acid (PFOA)	µg/L	0.001	<0.01	<0.01	0	<0.01	<0.001	0	<0.01	<0.01	0	<0.01	<0.001	0
Perfluorononanoic acid (PFNA)	µg/L	0.002	<0.02	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.02	<0.002	0
Perfluorodecanoic acid (PFDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001	<0.02	<0.02	0	<0.02	<0.001	0	<0.02	<0.02	0	<0.02	<0.001	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001	<0.05	<0.05	0	<0.05	<0.001	0	<0.05	<0.05	0	<0.05	<0.001	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.002	<0.05	<0.05	0	<0.05	<0.002	0	<0.05	<0.05	0	<0.05	<0.002	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.004	<0.05	<0.05	0	<0.05	<0.004	0	<0.05	<0.05	0	<0.05	<0.004	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.004	<0.02	<0.02	0	<0.02	<0.004	0	<0.02	<0.02	0	<0.02	<0.004	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.008	<0.05	<0.05	0	<0.05	<0.008	0	<0.05	<0.05	0	<0.05	<0.008	0
Perfluorooctane sulfonamidoacetic acid (FOSAA)	µg/L	0.002					<0.002						<0.002	
PFAS														
Sum of PFHxS and PFOS	µg/L	0.002	<0.01	<0.01	0	<0.01	<0.002	0	<0.01	<0.01	0	<0.01	0.006	0
Sum of PFAS	µg/L	0.001	<0.01	<0.01	0	<0.01	<0.001	0	<0.01	<0.01	0	<0.01	0.006	0

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Table B5 - RPDs Sediment Samples

	Field ID		0089_SD314_220607	0089_QC102_220607		0089_SD314_220607	0089_QC202_220607		0089_SD369_220607	0089_QC106_220607		0089_SD369_220607	0089_QC206_220607	
	Date		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022	
	Matrix Type		Sediment	Sediment		Sediment	Sediment		Sediment	Sediment		Sediment	Sediment	
	Lab Report Number		EP2206886	EP2206886	RPD	EP2206886	896805	RPD	EP2206885	EP2206885	RPD	EP2206885	896805	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	0.0021	0.0019	10	0.0021	<0.0004	**136**
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.0008	<0.001	<0.001	0	<0.001	<0.0008	0	<0.001	<0.001	0	<0.001	<0.0008	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0008	0	<0.0002	<0.0002	0	<0.0002	<0.0008	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.0002	0	<0.0005	<0.0005	0	<0.0005	<0.0002	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0004	<0.0005	<0.0005	0	<0.0005	<0.0004	0	<0.0005	<0.0005	0	<0.0005	<0.0004	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0008	0	<0.0005	<0.0005	0	<0.0005	<0.0008	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0004	<0.0005	<0.0005	0	<0.0005	<0.0004	0	<0.0005	<0.0005	0	<0.0005	<0.0004	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0008	0	<0.0005	<0.0005	0	<0.0005	<0.0008	0
Perfluorooctane sulfonamidoacetic acid (FOSAA)	mg/kg	0.0004					<0.0004						<0.0004	
PFAS														
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	0.0021	0.0019	10	0.0021	<0.0004	**136**
Sum of PFAS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	0.0021	0.0019	10	0.0021	<0.0002	**165**

*RPDs have only been considered where a concentration is greater than 1 times the LOR.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

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Table B5 - RPDs Sediment Samples

	Field ID		0089_SD335_220607	0089_QC113_220607		0089_SD335_220607	0089_QC213_220607		0089_SD407_220607	0089_QC114_220607		0089_SD407_220607	0089_QC214_220607	
	Date		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022		7/06/2022	7/06/2022	
	Matrix Type		Sediment	Sediment		Sediment	Sediment		Sediment	Sediment		Sediment	Sediment	
	Lab Report Number		EP2206882	EP2206882	RPD	EP2206882	896805	RPD	EP2206886	EP2206886	RPD	EP2206886	896805	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.0003	0.0004	29	0.0003	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.0008	<0.001	<0.001	0	<0.001	<0.0008	0	<0.001	<0.001	0	<0.001	<0.0008	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0008	0	<0.0002	<0.0002	0	<0.0002	<0.0008	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.0002	0	<0.0005	<0.0005	0	<0.0005	<0.0002	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0004	<0.0005	<0.0005	0	<0.0005	<0.0004	0	<0.0005	<0.0005	0	<0.0005	<0.0004	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0008	0	<0.0005	<0.0005	0	<0.0005	<0.0008	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0004	<0.0005	<0.0005	0	<0.0005	<0.0004	0	<0.0005	<0.0005	0	<0.0005	<0.0004	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.0008	0	<0.0005	<0.0005	0	<0.0005	<0.0008	0
Perfluorooctane sulfonamidoacetic acid (FOSAA)	mg/kg	0.0004					<0.0004						<0.0004	
PFAS														
Sum of PFHxS and PFOS	mg/kg	0.0002	0.0003	0.0004	29	0.0003	<0.0004	0	<0.0002	<0.0002	0	<0.0002	<0.0004	0
Sum of PFAS	mg/kg	0.0002	0.0003	0.0004	29	0.0003	<0.0002	40	<0.0002	<0.0002	0	<0.0002	<0.0002	0

APPENDIX

C

LABORATORY CERTIFICATES

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CHAIN OF CUSTODY

ALS COC#: 38626 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW123		07/06/2022 08:00 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
002	0089_MW121		07/06/2022 08:25 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_QC101		07/06/2022 08:26 AM	Water	ALS: 2 Non ALS: 0	No		X		
004	0089_MW500		07/06/2022 08:38 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW112		07/06/2022 08:53 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_QC105		07/06/2022 08:54 AM	Water	ALS: 2 Non ALS: 0	No		X		
007	0089_MW120		07/06/2022 09:02 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_MW109		07/06/2022 09:25 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
009	0089_QC107		07/06/2022 09:26 AM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: **38626** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW127		07/06/2022 09:41 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
011	0089_MW126		07/06/2022 10:22 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
012	0089_MW125		07/06/2022 10:32 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
013	0089_MW124		07/06/2022 11:16 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
014	0089_MW203		07/06/2022 12:34 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
015	0089_QC115		07/06/2022 12:35 PM	Water	ALS: 2 Non ALS: 0	No		X		
016	0089_MW236		07/06/2022 12:59 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

COC#: **38626** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW123	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW121	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW500	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW112	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW120	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW109	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_MW127	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW126	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW125	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **38626** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

013	0089_MW124	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_MW203	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
016	0089_MW236	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 38626 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW123	Clear Plastic Bottle - Natural	500 mL	00071121102406	Green	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00352101073559	Grey	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00350621033727	Grey	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00352101073696	Grey	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00350621067723	Grey	No	
002	0089_MW121	Clear Plastic Bottle - Natural	500 mL	00071121102349	Green	No	
002	0089_MW121	HDPE (no PTFE)	20 mL	00352101073982	Grey	No	
002	0089_MW121	HDPE (no PTFE)	20 mL	00352101074018	Grey	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00350621067679	Grey	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00350621067921	Grey	No	
004	0089_MW500	Clear Plastic Bottle - Natural	500 mL	00071121102348	Green	No	
004	0089_MW500	HDPE (no PTFE)	20 mL	00350621067661	Grey	No	
004	0089_MW500	HDPE (no PTFE)	20 mL	00350621068006	Grey	No	
005	0089_MW112	Clear Plastic Bottle - Natural	500 mL	00071121102334	Green	No	
005	0089_MW112	HDPE (no PTFE)	20 mL	00350621067700	Grey	No	
005	0089_MW112	HDPE (no PTFE)	20 mL	00350621067905	Grey	No	
006	0089_QC105	HDPE (no PTFE)	20 mL	00352101073646	Grey	No	
006	0089_QC105	HDPE (no PTFE)	20 mL	00352101073501	Grey	No	
007	0089_MW120	Clear Plastic Bottle - Natural	500 mL	00071121102385	Green	No	
007	0089_MW120	HDPE (no PTFE)	20 mL	00350621033731	Grey	No	
007	0089_MW120	HDPE (no PTFE)	20 mL	00350621067913	Grey	No	
008	0089_MW109	Clear Plastic Bottle - Natural	500 mL	00071121102397	Green	No	
008	0089_MW109	HDPE (no PTFE)	20 mL	00350621067964	Grey	No	
008	0089_MW109	HDPE (no PTFE)	20 mL	00350621067846	Grey	No	
009	0089_QC107	HDPE (no PTFE)	20 mL	00352101073893	Grey	No	
009	0089_QC107	HDPE (no PTFE)	20 mL	00352101073944	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 38626 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_MW127	Clear Plastic Bottle - Natural	500 mL	00071121102420	Green	No	
010	0089_MW127	HDPE (no PTFE)	20 mL	00350621067878	Grey	No	
010	0089_MW127	HDPE (no PTFE)	20 mL	00350621067384	Grey	No	
010	0089_MW127	HDPE (no PTFE)	20 mL	00352101073972	Grey	No	
010	0089_MW127	HDPE (no PTFE)	20 mL	00352101073899	Grey	No	
011	0089_MW126	Clear Plastic Bottle - Natural	500 mL	00071121102339	Green	No	
011	0089_MW126	HDPE (no PTFE)	20 mL	00350621067897	Grey	No	
011	0089_MW126	HDPE (no PTFE)	20 mL	00350621067729	Grey	No	
012	0089_MW125	Clear Plastic Bottle - Natural	500 mL	00071121102425	Green	No	
012	0089_MW125	HDPE (no PTFE)	20 mL	00350621067645	Grey	No	
012	0089_MW125	HDPE (no PTFE)	20 mL	00350621067912	Grey	No	
013	0089_MW124	Clear Plastic Bottle - Natural	500 mL	00071121102367	Green	No	
013	0089_MW124	HDPE (no PTFE)	20 mL	00350621067863	Grey	No	
013	0089_MW124	HDPE (no PTFE)	20 mL	00350621067950	Grey	No	
014	0089_MW203	Clear Plastic Bottle - Natural	500 mL	00071121102248	Green	No	
014	0089_MW203	HDPE (no PTFE)	20 mL	00350621033728	Grey	No	
014	0089_MW203	HDPE (no PTFE)	20 mL	00350621067835	Grey	No	
015	0089_QC115	HDPE (no PTFE)	20 mL	00352101073740	Grey	No	
015	0089_QC115	HDPE (no PTFE)	20 mL	00352101073845	Grey	No	
016	0089_MW236	HDPE (no PTFE)	20 mL	00350621067936	Grey	No	
016	0089_MW236	HDPE (no PTFE)	20 mL	00350621067911	Grey	No	
016	0089_MW236	Clear Plastic Bottle - Natural	500 mL	00071121102376	Green	No	

Total Bottle Count: ALS: 48, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206880**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38626	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW_MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2022 12:45	Issue Date	: 09-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 16 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206880-001	07-Jun-2022 08:00	0089_MW123_220607	✓	✓	✓	✓
EP2206880-002	07-Jun-2022 08:25	0089_MW121_220607	✓	✓	✓	✓
EP2206880-003	07-Jun-2022 08:26	0089_QC101_220607		✓		
EP2206880-004	07-Jun-2022 08:38	0089_MW500_220607	✓	✓	✓	✓
EP2206880-005	07-Jun-2022 08:53	0089_MW112_220607	✓	✓	✓	✓
EP2206880-006	07-Jun-2022 08:54	0089_QC105_220607		✓		
EP2206880-007	07-Jun-2022 09:02	0089_MW120_220607	✓	✓	✓	✓
EP2206880-008	07-Jun-2022 09:25	0089_MW109_220607	✓	✓	✓	✓
EP2206880-009	07-Jun-2022 09:26	0089_QC107_220607		✓		
EP2206880-010	07-Jun-2022 09:41	0089_MW127_220607	✓	✓	✓	✓
EP2206880-011	07-Jun-2022 10:22	0089_MW126_220607	✓	✓	✓	✓
EP2206880-012	07-Jun-2022 10:32	0089_MW125_220607	✓	✓	✓	✓
EP2206880-013	07-Jun-2022 11:16	0089_MW124_220607	✓	✓	✓	✓
EP2206880-014	07-Jun-2022 12:34	0089_MW203_220607	✓	✓	✓	✓
EP2206880-015	07-Jun-2022 12:35	0089_QC115_220607		✓		
EP2206880-016	07-Jun-2022 12:59	0089_MW236_220607	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206880**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022 12:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38626	Issue Date	: 17-Jun-2022 19:31
Sampler	: [redacted]		
Site	: Stirling GW_MB		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_220607	0089_MW121_220607	0089_QC101_220607	0089_MW500_220607	0089_MW112_220607
				Sampling date / time	07-Jun-2022 08:00	07-Jun-2022 08:25	07-Jun-2022 08:26	07-Jun-2022 08:38	07-Jun-2022 08:53
Compound	CAS Number	LOR	Unit		EP2206880-001	EP2206880-002	EP2206880-003	EP2206880-004	EP2206880-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**410**	**294**	----	**408**	**218**
Total Alkalinity as CaCO3	----	1	mg/L		**410**	**294**	----	**408**	**218**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**6**	**14**	----	**31**	**12**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**158**	**70**	----	**40**	**25**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**109**	**97**	----	**136**	**75**
Magnesium	7439-95-4	1	mg/L		**30**	**14**	----	**17**	**9**
Sodium	7440-23-5	1	mg/L		**93**	**30**	----	**23**	**13**
Potassium	7440-09-7	1	mg/L		**5**	**2**	----	**3**	<1
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**12.8**	**8.14**	----	**9.92**	**5.31**
ø Total Cations	----	0.01	meq/L		**12.1**	**7.35**	----	**9.26**	**5.05**
ø Ionic Balance	----	0.01	%		**2.78**	**5.11**	----	**3.45**	**2.53**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.20**	**0.05**	**0.05**	**0.84**	**0.02**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.18**	**0.16**	**0.16**	**2.01**	**0.13**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.57**	**5.30**	**5.40**	**24.2**	**7.64**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.22**	**0.27**	**2.00**	**1.52**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.05**	**0.59**	**0.72**	**49.3**	**73.6**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	**0.3**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.12**	**0.13**	**0.12**	**0.83**	**0.12**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.46**	**0.46**	**0.45**	**4.85**	**0.59**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.03**	**0.08**	**0.08**	**0.64**	**0.23**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_220607	0089_MW121_220607	0089_QC101_220607	0089_MW500_220607	0089_MW112_220607
				Sampling date / time	07-Jun-2022 08:00	07-Jun-2022 08:25	07-Jun-2022 08:26	07-Jun-2022 08:38	07-Jun-2022 08:53
Compound	CAS Number	LOR	Unit		EP2206880-001	EP2206880-002	EP2206880-003	EP2206880-004	EP2206880-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.20**	**0.20**	**1.83**	**0.99**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	**0.03**	**0.08**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.71**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	**0.08**	**0.10**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_220607	0089_MW121_220607	0089_QC101_220607	0089_MW500_220607	0089_MW112_220607
				Sampling date / time	07-Jun-2022 08:00	07-Jun-2022 08:25	07-Jun-2022 08:26	07-Jun-2022 08:38	07-Jun-2022 08:53
Compound	CAS Number	LOR	Unit		EP2206880-001	EP2206880-002	EP2206880-003	EP2206880-004	EP2206880-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.61**	**7.19**	**7.45**	**86.9**	**85.7**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.62**	**5.89**	**6.12**	**73.5**	**81.2**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.43**	**6.81**	**7.02**	**82.9**	**83.3**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**93.1**	**106**	**60.6**	**90.5**
13C8-PFOA	----	0.02	%		**99.8**	**99.5**	**98.8**	**103**	**93.3**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC105_220607	0089_MW120_220607	0089_MW109_220607	0089_QC107_220607	0089_MW127_220607
				Sampling date / time	07-Jun-2022 08:54	07-Jun-2022 09:02	07-Jun-2022 09:25	07-Jun-2022 09:26	07-Jun-2022 09:41
					EP2206880-006	EP2206880-007	EP2206880-008	EP2206880-009	EP2206880-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	**258**	**354**	----	**498**
Total Alkalinity as CaCO3	----	1	mg/L		----	**258**	**354**	----	**498**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	**22**	**18**	----	**1760**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	**44**	**107**	----	**14400**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	**79**	**113**	----	**401**
Magnesium	7439-95-4	1	mg/L		----	**17**	**22**	----	**1010**
Sodium	7440-23-5	1	mg/L		----	**31**	**60**	----	**6550**
Potassium	7440-09-7	1	mg/L		----	**3**	**2**	----	**364**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	**6.85**	**10.5**	----	**453**
ø Total Cations	----	0.01	meq/L		----	**6.77**	**10.1**	----	**397**
ø Ionic Balance	----	0.01	%		----	**0.64**	**1.73**	----	**6.52**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.02**	**0.02**	**0.14**	**0.15**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.15**	**0.05**	**0.36**	**0.35**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**8.02**	**3.52**	**6.15**	**5.70**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**1.43**	**0.74**	**0.52**	**0.50**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**80.8**	**1.64**	**4.64**	**4.47**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.12**	<0.02	**0.15**	**0.16**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.60**	**0.10**	**0.81**	**0.81**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.25**	<0.02	**0.09**	**0.08**	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_220607	0089_MW120_220607	0089_MW109_220607	0089_QC107_220607	0089_MW127_220607
				Sampling date / time	07-Jun-2022 08:54	07-Jun-2022 09:02	07-Jun-2022 09:25	07-Jun-2022 09:26	07-Jun-2022 09:41
Compound	CAS Number	LOR	Unit		EP2206880-006	EP2206880-007	EP2206880-008	EP2206880-009	EP2206880-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.00**	**0.42**	**0.29**	**0.28**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.08**	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.74**	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.09**	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_220607	0089_MW120_220607	0089_MW109_220607	0089_QC107_220607	0089_MW127_220607
				Sampling date / time	07-Jun-2022 08:54	07-Jun-2022 09:02	07-Jun-2022 09:25	07-Jun-2022 09:26	07-Jun-2022 09:41
Compound	CAS Number	LOR	Unit		EP2206880-006	EP2206880-007	EP2206880-008	EP2206880-009	EP2206880-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**93.3**	**6.49**	**13.2**	**12.5**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**88.8**	**5.16**	**10.8**	**10.2**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**90.9**	**5.70**	**12.3**	**11.6**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.8**	**96.9**	**107**	**107**	**101**
13C8-PFOA	----	0.02	%		**96.9**	**99.4**	**95.9**	**99.5**	**96.8**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW126_220607	0089_MW125_220607	0089_MW124_220607	0089_MW203_220607	0089_QC115_220607
				Sampling date / time	07-Jun-2022 10:22	07-Jun-2022 10:32	07-Jun-2022 11:16	07-Jun-2022 12:34	07-Jun-2022 12:35
					EP2206880-011	EP2206880-012	EP2206880-013	EP2206880-014	EP2206880-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**546**	**587**	**343**	**312**	----
Total Alkalinity as CaCO3	----	1	mg/L		**546**	**587**	**343**	**312**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1740**	**1930**	**1860**	**70**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**15800**	**15800**	**14300**	**47**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**436**	**476**	**431**	**79**	----
Magnesium	7439-95-4	1	mg/L		**1020**	**1100**	**970**	**40**	----
Sodium	7440-23-5	1	mg/L		**6690**	**7470**	**6720**	**54**	----
Potassium	7440-09-7	1	mg/L		**369**	**420**	**382**	**6**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**493**	**498**	**449**	**9.02**	----
ø Total Cations	----	0.01	meq/L		**406**	**450**	**403**	**9.74**	----
ø Ionic Balance	----	0.01	%		**9.64**	**5.03**	**5.34**	**3.84**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.18**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.24**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.98**	<0.01	**0.04**	**0.04**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.04**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.25**	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW126_220607	0089_MW125_220607	0089_MW124_220607	0089_MW203_220607	0089_QC115_220607
				Sampling date / time	07-Jun-2022 10:22	07-Jun-2022 10:32	07-Jun-2022 11:16	07-Jun-2022 12:34	07-Jun-2022 12:35
Compound	CAS Number	LOR	Unit		EP2206880-011	EP2206880-012	EP2206880-013	EP2206880-014	EP2206880-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW126_220607	0089_MW125_220607	0089_MW124_220607	0089_MW203_220607	0089_QC115_220607
				Sampling date / time	07-Jun-2022 10:22	07-Jun-2022 10:32	07-Jun-2022 11:16	07-Jun-2022 12:34	07-Jun-2022 12:35
					EP2206880-011	EP2206880-012	EP2206880-013	EP2206880-014	EP2206880-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**1.69**	<0.01	**0.04**	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.98**	<0.01	**0.04**	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**1.45**	<0.01	**0.04**	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.3**	**106**	**99.2**	**100**	**103**
13C8-PFOA	----	0.02	%		**98.0**	**100**	**94.4**	**95.8**	**98.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW236_220607	----	----	----	----
				Sampling date / time	07-Jun-2022 12:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206880-016	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**280**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**280**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**23**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**24**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**85**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**13**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**22**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**1**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**6.75**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**6.29**	----	----	----	----
ø Ionic Balance	----	0.01	%		**3.50**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.08**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.34**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**18.1**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.95**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**84.7**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.11**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.67**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.36**	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW236_220607	----	----	----	----
				Sampling date / time	07-Jun-2022 12:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206880-016	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.68**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**4.88**	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW236_220607	----	----	----	----
				Sampling date / time	07-Jun-2022 12:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206880-016	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**112**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**103**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**106**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.4**	----	----	----	----
13C8-PFOA	----	0.02	%		**97.8**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206880**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38626	Issue Date	: 17-Jun-2022
Sampler	: [redacted]		
Site	: Stirling GW_MB		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4402870)									
EP2206880-002	0089_MW121_220607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	294	294	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	294	294	0.0	0% - 20%
EP2206880-016	0089_MW236_220607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	280	282	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	280	282	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4393516)									
EP2206880-001	0089_MW123_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	6	0.0	No Limit
EP2206880-014	0089_MW203_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	70	69	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4393515)									
EP2206880-001	0089_MW123_220607	ED045G: Chloride	16887-00-6	1	mg/L	158	158	0.0	0% - 20%
EP2206880-014	0089_MW203_220607	ED045G: Chloride	16887-00-6	1	mg/L	47	57	18.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4392199)									
EP2206880-001	0089_MW123_220607	ED093F: Calcium	7440-70-2	1	mg/L	109	112	3.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	30	30	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	93	94	1.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
EP2206880-014	0089_MW203_220607	ED093F: Calcium	7440-70-2	1	mg/L	79	81	2.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	40	41	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	54	54	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4399608)									
EP2206880-001	0089_MW123_220607	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.57	0.58	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.05	0.04	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.20	0.21	6.1	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.18	0.19	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4399608)									
EP2206880-001	0089_MW123_220607	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.12	0.12	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.46	0.45	3.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4399608)									
EP2206880-001	0089_MW123_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4399608)									
EP2206880-001	0089_MW123_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4399608) - continued									
EP2206880-001	0089_MW123_220607	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4399608)									
EP2206880-001	0089_MW123_220607	EP231X: Sum of PFAS	----	0.01	µg/L	1.61	1.62	0.6	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4402870)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	103	81.2	126
				<1	200 mg/L	101	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393516)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	87.7	113
				<1	500 mg/L	97.2	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4393515)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.4	87.9	114
				<1	1000 mg/L	97.7	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4392199)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.4	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	90.8	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	109	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.8	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4399608)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	93.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	98.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4399608)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4399608) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	89.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4399608)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	106	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	99.4	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.5	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	95.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	100	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4399608)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	129	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	95.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	112	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393516)							
EP2206880-001	0089_MW123_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	104	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4393515)							
EP2206880-001	0089_MW123_220607	ED045G: Chloride	16887-00-6	1000 mg/L	101	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4399608)							
EP2206880-010	0089_MW127_220607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	90.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	97.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	98.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	93.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	99.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	96.8	53.0	142

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4399608)							
EP2206880-010	0089_MW127_220607	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	83.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	100	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	98.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	103	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	104	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	109	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	88.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4399608)							
EP2206880-010	0089_MW127_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	106	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	102	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	81.4	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.9	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	95.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4399608)							
EP2206880-010	0089_MW127_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	104	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	96.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	92.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	115	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206880**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Site	: Stirling GW_MB	Issue Date	: 17-Jun-2022
Sampler	: [redacted]	No. of samples received	: 16
Order number	: pfas-omp/Stirling	No. of samples analysed	: 16

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	18	5.56	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW123_220607,	0089_MW121_220607,	**07-Jun-2022**	**----**	----	----	**16-Jun-2022**	21-Jun-2022	✓
0089_MW500_220607,	0089_MW112_220607,							
0089_MW120_220607,	0089_MW109_220607,							
0089_MW127_220607,	0089_MW126_220607,							
0089_MW125_220607,	0089_MW124_220607,							
0089_MW203_220607,	0089_MW236_220607							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW123_220607,	0089_MW121_220607,	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓
0089_MW500_220607,	0089_MW112_220607,							
0089_MW120_220607,	0089_MW109_220607,							
0089_MW127_220607,	0089_MW126_220607,							
0089_MW125_220607,	0089_MW124_220607,							
0089_MW203_220607,	0089_MW236_220607							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW123_220607,	0089_MW121_220607,	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓
0089_MW500_220607,	0089_MW112_220607,							
0089_MW120_220607,	0089_MW109_220607,							
0089_MW127_220607,	0089_MW126_220607,							
0089_MW125_220607,	0089_MW124_220607,							
0089_MW203_220607,	0089_MW236_220607							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW123_220607, 0089_MW121_220607, 0089_MW500_220607, 0089_MW112_220607, 0089_MW120_220607, 0089_MW109_220607, 0089_MW127_220607, 0089_MW126_220607, 0089_MW125_220607, 0089_MW124_220607, 0089_MW203_220607, 0089_MW236_220607	**07-Jun-2022**	**----**	----	----	**10-Jun-2022**	14-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_220607, 0089_MW121_220607, 0089_QC101_220607, 0089_MW500_220607, 0089_MW112_220607, 0089_QC105_220607, 0089_MW120_220607, 0089_MW109_220607, 0089_QC107_220607, 0089_MW127_220607, 0089_MW126_220607, 0089_MW125_220607, 0089_MW124_220607, 0089_MW203_220607, 0089_QC115_220607, 0089_MW236_220607	**07-Jun-2022**	**15-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_220607, 0089_MW121_220607, 0089_QC101_220607, 0089_MW500_220607, 0089_MW112_220607, 0089_QC105_220607, 0089_MW120_220607, 0089_MW109_220607, 0089_QC107_220607, 0089_MW127_220607, 0089_MW126_220607, 0089_MW125_220607, 0089_MW124_220607, 0089_MW203_220607, 0089_QC115_220607, 0089_MW236_220607	**07-Jun-2022**	**15-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW123_220607, 0089_MW121_220607, 0089_QC101_220607, 0089_MW500_220607, 0089_MW112_220607, 0089_QC105_220607, 0089_MW120_220607, 0089_MW109_220607, 0089_QC107_220607, 0089_MW127_220607, 0089_MW126_220607, 0089_MW125_220607, 0089_MW124_220607, 0089_MW203_220607, 0089_QC115_220607, 0089_MW236_220607	**07-Jun-2022**	**15-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW123_220607,	0089_MW121_220607,	**07-Jun-2022**	**15-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
0089_QC101_220607,	0089_MW500_220607,							
0089_MW112_220607,	0089_QC105_220607,							
0089_MW120_220607,	0089_MW109_220607,							
0089_QC107_220607,	0089_MW127_220607,							
0089_MW126_220607,	0089_MW125_220607,							
0089_MW124_220607,	0089_MW203_220607,							
0089_QC115_220607,	0089_MW236_220607							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW123_220607,	0089_MW121_220607,	**07-Jun-2022**	**15-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
0089_QC101_220607,	0089_MW500_220607,							
0089_MW112_220607,	0089_QC105_220607,							
0089_MW120_220607,	0089_MW109_220607,							
0089_QC107_220607,	0089_MW127_220607,							
0089_MW126_220607,	0089_MW125_220607,							
0089_MW124_220607,	0089_MW203_220607,							
0089_QC115_220607,	0089_MW236_220607							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 38627 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW363		07/06/2022 09:52 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_SW134		07/06/2022 10:01 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_QC108		07/06/2022 10:02 AM	Water	ALS: 2 Non ALS: 0	No	Partial 1/8		
004	0089_PW341		07/06/2022 10:12 AM	Water	ALS: 3 Non ALS: 0	No	Partial 3/8		
005	0089_PW362		07/06/2022 10:41 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_QC110		07/06/2022 10:42 AM	Water	ALS: 2 Non ALS: 0	No	Partial 1/8		
007	0089_PW340		07/06/2022 10:51 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab QC
008	0089_SW132		07/06/2022 11:02 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_PW335		07/06/2022 11:27 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 38627 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW130		07/06/2022 11:35 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_PW364		07/06/2022 11:44 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_PW401		07/06/2022 04:12 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
013	0089_PW380		07/06/2022 04:14 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_SW382		07/06/2022 04:15 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
015	0089_PW351		07/06/2022 04:17 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 38627 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW363	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW134	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_QC108	Surface Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
004	0089_PW341	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW362	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_QC110	Surface Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
007	0089_PW340	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_SW132	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW335	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_SW130	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 38627 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

011	0089_PW364	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_PW401	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_PW380	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_SW382	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_PW351	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 38627 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW363	Clear Plastic Bottle - Natural	500 mL	00071121102318	Green	No	
001	0089_PW363	HDPE (no PTFE)	20 mL	00350621067919	Grey	No	
001	0089_PW363	HDPE (no PTFE)	20 mL	00350621067881	Grey	No	
002	0089_SW134	Clear Plastic Bottle - Natural	500 mL	00071121102432	Green	No	
002	0089_SW134	HDPE (no PTFE)	20 mL	00350621067929	Grey	No	
002	0089_SW134	HDPE (no PTFE)	20 mL	00350621033732	Grey	No	
003	0089_QC108	HDPE (no PTFE)	20 mL	00352101073738	Grey	No	
003	0089_QC108	HDPE (no PTFE)	20 mL	00352101073578	Grey	No	
004	0089_PW341	Clear Plastic Bottle - Natural	500 mL	00071121102246	Green	No	
004	0089_PW341	HDPE (no PTFE)	20 mL	00350621067785	Grey	No	
004	0089_PW341	HDPE (no PTFE)	20 mL	00350621067840	Grey	No	
005	0089_PW362	Clear Plastic Bottle - Natural	500 mL	00071121102361	Green	No	
005	0089_PW362	HDPE (no PTFE)	20 mL	00350621067854	Grey	No	
005	0089_PW362	HDPE (no PTFE)	20 mL	00350621068003	Grey	No	
006	0089_QC110	HDPE (no PTFE)	20 mL	00352101074011	Grey	No	
006	0089_QC110	HDPE (no PTFE)	20 mL	00352101073690	Grey	No	
007	0089_PW340	Clear Plastic Bottle - Natural	500 mL	00071121102436	Green	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00352101073489	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00350621067730	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00352101073892	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00350621067963	Grey	No	
008	0089_SW132	Clear Plastic Bottle - Natural	500 mL	00071121102337	Green	No	
008	0089_SW132	HDPE (no PTFE)	20 mL	00350621067759	Grey	No	
008	0089_SW132	HDPE (no PTFE)	20 mL	00350621067524	Grey	No	
009	0089_PW335	HDPE (no PTFE)	20 mL	00350621067662	Grey	No	
009	0089_PW335	HDPE (no PTFE)	20 mL	00350621067715	Grey	No	

CHAIN OF CUSTODY

COC#: **38627** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW335	Clear Plastic Bottle - Natural	500 mL	00071121102437	Green	No	
010	0089_SW130	HDPE (no PTFE)	20 mL	00350621067902	Grey	No	
010	0089_SW130	HDPE (no PTFE)	20 mL	00350621067808	Grey	No	
010	0089_SW130	Clear Plastic Bottle - Natural	500 mL	00071121102429	Green	No	
011	0089_PW364	Clear Plastic Bottle - Natural	500 mL	00071121102392	Green	No	
011	0089_PW364	HDPE (no PTFE)	20 mL	00350621068015	Grey	No	
011	0089_PW364	HDPE (no PTFE)	20 mL	00350621067901	Grey	No	
012	0089_PW401	HDPE (no PTFE)	20 mL	00350621067799	Grey	No	
012	0089_PW401	HDPE (no PTFE)	20 mL	00350621067877	Grey	No	
012	0089_PW401	Clear Plastic Bottle - Natural	500 mL	00071121102278	Green	No	
013	0089_PW380	Clear Plastic Bottle - Natural	500 mL	00071121102384	Green	No	
013	0089_PW380	HDPE (no PTFE)	20 mL	00350621067699	Grey	No	
013	0089_PW380	HDPE (no PTFE)	20 mL	00350621067816	Grey	No	
014	0089_SW382	Clear Plastic Bottle - Natural	500 mL	00071121102231	Green	No	
014	0089_SW382	HDPE (no PTFE)	20 mL	00350621033718	Grey	No	
014	0089_SW382	HDPE (no PTFE)	20 mL	00350621033712	Grey	No	
015	0089_PW351	Clear Plastic Bottle - Natural	500 mL	00071121102416	Green	No	
015	0089_PW351	HDPE (no PTFE)	20 mL	00350621067542	Grey	No	
015	0089_PW351	HDPE (no PTFE)	20 mL	00350621067771	Grey	No	

Total Bottle Count: ALS: 45, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206881**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38627	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW_MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2022 12:45	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206881-001	07-Jun-2022 09:52	0089_PW363_220607	✓	✓	✓	✓
EP2206881-002	07-Jun-2022 10:01	0089_SW134_220607	✓	✓	✓	✓
EP2206881-003	07-Jun-2022 10:02	0089_QC108_220607		✓		
EP2206881-004	07-Jun-2022 10:12	0089_PW341_220607	✓	✓	✓	✓
EP2206881-005	07-Jun-2022 10:41	0089_PW362_220607	✓	✓	✓	✓
EP2206881-006	07-Jun-2022 10:42	0089_QC110_220607		✓		
EP2206881-007	07-Jun-2022 10:51	0089_PW340_220607	✓	✓	✓	✓
EP2206881-008	07-Jun-2022 11:02	0089_SW132_220607	✓	✓	✓	✓
EP2206881-009	07-Jun-2022 11:27	0089_PW335_220607	✓	✓	✓	✓
EP2206881-010	07-Jun-2022 11:35	0089_SW130_220607	✓	✓	✓	✓
EP2206881-011	07-Jun-2022 11:44	0089_PW364_220607	✓	✓	✓	✓
EP2206881-012	07-Jun-2022 16:12	0089_PW401_220607	✓	✓	✓	✓
EP2206881-013	07-Jun-2022 16:14	0089_PW380_220607	✓	✓	✓	✓
EP2206881-014	07-Jun-2022 16:15	0089_SW382_220607	✓	✓	✓	✓
EP2206881-015	07-Jun-2022 16:17	0089_PW351_220607	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206881**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022 12:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38627	Issue Date	: 17-Jun-2022 19:33
Sampler	: [redacted]		
Site	: Stirling SW/PW_MB		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW363_220607	0089_SW134_220607	0089_QC108_220607	0089_PW341_220607	0089_PW362_220607
				Sampling date / time	07-Jun-2022 09:52	07-Jun-2022 10:01	07-Jun-2022 10:02	07-Jun-2022 10:12	07-Jun-2022 10:41
					EP2206881-001	EP2206881-002	EP2206881-003	EP2206881-004	EP2206881-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**128**	**128**	----	**178**	**156**
Total Alkalinity as CaCO3	----	1	mg/L		**128**	**128**	----	**178**	**156**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2490**	**2490**	----	**2530**	**2630**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17800**	**18600**	----	**17900**	**17800**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**462**	**457**	----	**454**	**456**
Magnesium	7439-95-4	1	mg/L		**1320**	**1310**	----	**1250**	**1290**
Sodium	7440-23-5	1	mg/L		**9750**	**9630**	----	**9140**	**9590**
Potassium	7440-09-7	1	mg/L		**566**	**561**	----	**554**	**553**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**556**	**579**	----	**561**	**560**
ø Total Cations	----	0.01	meq/L		**570**	**564**	----	**537**	**560**
ø Ionic Balance	----	0.01	%		**1.22**	**1.33**	----	**2.18**	**0.02**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	**0.02**	**0.01**	**0.01**	**0.04**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW363_220607	0089_SW134_220607	0089_QC108_220607	0089_PW341_220607	0089_PW362_220607
				Sampling date / time	07-Jun-2022 09:52	07-Jun-2022 10:01	07-Jun-2022 10:02	07-Jun-2022 10:12	07-Jun-2022 10:41
Compound	CAS Number	LOR	Unit		EP2206881-001	EP2206881-002	EP2206881-003	EP2206881-004	EP2206881-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW363_220607	0089_SW134_220607	0089_QC108_220607	0089_PW341_220607	0089_PW362_220607
				Sampling date / time	07-Jun-2022 09:52	07-Jun-2022 10:01	07-Jun-2022 10:02	07-Jun-2022 10:12	07-Jun-2022 10:41
Compound	CAS Number	LOR	Unit		EP2206881-001	EP2206881-002	EP2206881-003	EP2206881-004	EP2206881-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.01**	**0.02**	**0.01**	**0.01**	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.02**	**0.01**	**0.01**	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**0.02**	**0.01**	**0.01**	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**109**	**96.8**	**107**	**104**
13C8-PFOA	----	0.02	%		**104**	**106**	**95.0**	**103**	**106**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_QC110_220607	0089_PW340_220607	0089_SW132_220607	0089_PW335_220607	0089_SW130_220607
			Sampling date / time	07-Jun-2022 10:42	07-Jun-2022 10:51	07-Jun-2022 11:02	07-Jun-2022 11:27	07-Jun-2022 11:35
Compound	CAS Number	LOR	Unit	EP2206881-006	EP2206881-007	EP2206881-008	EP2206881-009	EP2206881-010
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	----	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	----	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	----	166	130	164	123
Total Alkalinity as CaCO3	----	1	mg/L	----	166	130	164	123
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	2480	2500	2490	2470
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	----	18000	18400	20200	18000
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	----	454	442	468	435
Magnesium	7439-95-4	1	mg/L	----	1280	1270	1310	1250
Sodium	7440-23-5	1	mg/L	----	9420	9390	9690	9290
Potassium	7440-09-7	1	mg/L	----	554	546	558	544
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	----	563	574	625	562
ø Total Cations	----	0.01	meq/L	----	552	549	567	542
ø Ionic Balance	----	0.01	%	----	0.97	2.20	4.87	1.72
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.03	<0.01	0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC110_220607	0089_PW340_220607	0089_SW132_220607	0089_PW335_220607	0089_SW130_220607
				Sampling date / time	07-Jun-2022 10:42	07-Jun-2022 10:51	07-Jun-2022 11:02	07-Jun-2022 11:27	07-Jun-2022 11:35
Compound	CAS Number	LOR	Unit		EP2206881-006	EP2206881-007	EP2206881-008	EP2206881-009	EP2206881-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC110_220607	0089_PW340_220607	0089_SW132_220607	0089_PW335_220607	0089_SW130_220607
				Sampling date / time	07-Jun-2022 10:42	07-Jun-2022 10:51	07-Jun-2022 11:02	07-Jun-2022 11:27	07-Jun-2022 11:35
Compound	CAS Number	LOR	Unit		EP2206881-006	EP2206881-007	EP2206881-008	EP2206881-009	EP2206881-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	**0.03**	<0.01	**0.01**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	**0.03**	<0.01	**0.01**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**0.03**	<0.01	**0.01**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**107**	**105**	**108**	**97.2**
13C8-PFOA	----	0.02	%		**107**	**105**	**104**	**104**	**102**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW401_220607	0089_PW380_220607	0089_SW382_220607	0089_PW351_220607	----
				Sampling date / time	07-Jun-2022 16:12	07-Jun-2022 16:14	07-Jun-2022 16:15	07-Jun-2022 16:17	----
Compound	CAS Number	LOR	Unit		EP2206881-012	EP2206881-013	EP2206881-014	EP2206881-015	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	132	123	124	----
Total Alkalinity as CaCO3	----	1	mg/L		124	132	123	124	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2550	2530	2440	2470	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17700	18200	17900	17700	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		469	467	458	447	----
Magnesium	7439-95-4	1	mg/L		1330	1340	1310	1280	----
Sodium	7440-23-5	1	mg/L		9880	9830	9730	9380	----
Potassium	7440-09-7	1	mg/L		568	580	567	543	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		555	569	558	553	----
ø Total Cations	----	0.01	meq/L		577	576	568	550	----
ø Ionic Balance	----	0.01	%		1.97	0.64	0.90	0.33	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW401_220607	0089_PW380_220607	0089_SW382_220607	0089_PW351_220607	----
				Sampling date / time	07-Jun-2022 16:12	07-Jun-2022 16:14	07-Jun-2022 16:15	07-Jun-2022 16:17	----
Compound	CAS Number	LOR	Unit		EP2206881-012	EP2206881-013	EP2206881-014	EP2206881-015	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW401_220607	0089_PW380_220607	0089_SW382_220607	0089_PW351_220607	----
				Sampling date / time	07-Jun-2022 16:12	07-Jun-2022 16:14	07-Jun-2022 16:15	07-Jun-2022 16:17	----
Compound	CAS Number	LOR	Unit		EP2206881-012	EP2206881-013	EP2206881-014	EP2206881-015	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**107**	**105**	**97.8**	----
13C8-PFOA	----	0.02	%		**101**	**102**	**102**	**99.0**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW364_220607	----	----	----	----
				Sampling date / time	07-Jun-2022 11:44	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206881-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**148**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**148**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2530**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18200**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**490**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1380**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**10100**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**587**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**569**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**592**	----	----	----	----
ø Ionic Balance	----	0.01	%		**2.01**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.03**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW364_220607	----	----	----	----
				Sampling date / time	07-Jun-2022 11:44	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206881-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	**0089_PW364_220607**	----	----	----	----
				Sampling date / time	07-Jun-2022 11:44	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2206881-011**	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.03**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	----	----	----	----
13C8-PFOA	----	0.02	%		**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206881**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38627	Issue Date	: 17-Jun-2022
Sampler	: [redacted]		
Site	: Stirling SW/PW_MB		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4402870)									
EP2206880-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	294	294	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	294	294	0.0	0% - 20%
EP2206880-016	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	280	282	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	280	282	0.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4402871)									
EP2206881-012	0089_PW401_220607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	126	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	126	1.1	0% - 20%
EP2206883-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	651	652	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	651	652	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4393516)									
EP2206880-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	6	0.0	No Limit
EP2206880-014	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	70	69	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4393519)									
EP2206881-011	0089_PW364_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2580	1.9	0% - 20%
EP2206883-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	56	56	0.0	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 4393515)									
EP2206880-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	158	158	0.0	0% - 20%
EP2206880-014	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	47	57	18.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4393518)									
EP2206881-011	0089_PW364_220607	ED045G: Chloride	16887-00-6	1	mg/L	18200	17500	3.5	0% - 20%
EP2206883-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	538	590	9.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4392199)									
EP2206880-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	109	112	3.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	30	30	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	93	94	1.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
EP2206880-014	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	79	81	2.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	40	41	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	54	54	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4392200)									
EP2206881-011	0089_PW364_220607	ED093F: Calcium	7440-70-2	1	mg/L	490	482	1.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1360	1.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10100	9990	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	587	578	1.6	0% - 20%
EP2206883-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	111	109	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	98	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	282	280	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	26	26	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4401536)									
EP2206881-007	0089_PW340_220607	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2220912-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.10	0.11	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.16	0.16	0.0	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4401536)									
EP2206881-007	0089_PW340_220607	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4401536) - continued									
EP2206881-007	0089_PW340_220607	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
ES2220912-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4401536)									
EP2206881-007	0089_PW340_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2220912-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4401536) - continued									
ES2220912-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4401536)									
EP2206881-007	0089_PW340_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2220912-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4401536)									
EP2206881-007	0089_PW340_220607	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.03	0.0	No Limit
ES2220912-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.29	0.30	3.4	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4402870)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	103	81.2	126
				<1	200 mg/L	101	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4402871)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	101	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393516)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	87.7	113
				<1	500 mg/L	97.2	87.7	113
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393519)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	87.7	113
				<1	500 mg/L	94.0	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4393515)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.4	87.9	114
				<1	1000 mg/L	97.7	87.9	114
ED045G: Chloride by Discrete Analyser (QCLot: 4393518)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.1	87.9	114
				<1	1000 mg/L	99.2	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4392199)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.4	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	90.8	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	109	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.8	89.7	108
ED093F: Dissolved Major Cations (QCLot: 4392200)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	93.1	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	111	87.3	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 4392200) - continued								
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.5	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401536)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	93.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	120	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	123	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	118	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	128	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401536)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	104	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	126	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	125	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	127	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	127	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	128	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	125	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	100	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401536)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	119	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	125	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	110	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	114	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	110	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	116	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	122	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401536)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	117	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	113	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	128	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	117	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393516)							
EP2206880-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	104	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393519)							
EP2206881-011	0089_PW364_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4393515)							
EP2206880-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	101	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4393518)							
EP2206881-011	0089_PW364_220607	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401536)							
ES2220911-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	123	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	82.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	70.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	116	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	99.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	121	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401536)							
ES2220911-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	124	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	98.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	117	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	114	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	124	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	117	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	124	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	122	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	102	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	112	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401536)							
ES2220911-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	124	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	104	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	120	62.6	147

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401536) - continued							
ES2220911-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	122	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	114	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401536)							
ES2220911-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	110	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	99.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	116	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	106	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206881**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Site	: Stirling SW/PW_MB	Issue Date	: 17-Jun-2022
Sampler	: [redacted]	No. of samples received	: 15
Order number	: pfas-omp/Stirling	No. of samples analysed	: 15

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206881--011	0089_PW364_220607	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206881--011	0089_PW364_220607	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW363_220607, 0089_SW134_220607, 0089_PW341_220607, 0089_PW362_220607, 0089_PW340_220607, 0089_SW132_220607, 0089_PW335_220607, 0089_SW130_220607, 0089_PW364_220607, 0089_PW401_220607, 0089_PW380_220607, 0089_SW382_220607, 0089_PW351_220607	**07-Jun-2022**	**----**	----	----	**16-Jun-2022**	21-Jun-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW363_220607, 0089_SW134_220607, 0089_PW341_220607, 0089_PW362_220607, 0089_PW340_220607, 0089_SW132_220607, 0089_PW335_220607, 0089_SW130_220607, 0089_PW364_220607, 0089_PW401_220607, 0089_PW380_220607, 0089_SW382_220607, 0089_PW351_220607	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW363_220607, 0089_SW134_220607, 0089_PW341_220607, 0089_PW362_220607, 0089_PW340_220607, 0089_SW132_220607, 0089_PW335_220607, 0089_SW130_220607, 0089_PW364_220607, 0089_PW401_220607, 0089_PW380_220607, 0089_SW382_220607, 0089_PW351_220607	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW363_220607, 0089_SW134_220607, 0089_PW341_220607, 0089_PW362_220607, 0089_PW340_220607, 0089_SW132_220607, 0089_PW335_220607, 0089_SW130_220607, 0089_PW364_220607, 0089_PW401_220607, 0089_PW380_220607, 0089_SW382_220607, 0089_PW351_220607	**07-Jun-2022**	**----**	----	----	**10-Jun-2022**	14-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW363_220607, 0089_SW134_220607, 0089_QC108_220607, 0089_PW341_220607, 0089_PW362_220607, 0089_QC110_220607, 0089_PW340_220607, 0089_SW132_220607, 0089_PW335_220607, 0089_SW130_220607, 0089_PW364_220607, 0089_PW401_220607, 0089_PW380_220607, 0089_SW382_220607, 0089_PW351_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW363_220607, 0089_SW134_220607, 0089_QC108_220607, 0089_PW341_220607, 0089_PW362_220607, 0089_QC110_220607, 0089_PW340_220607, 0089_SW132_220607, 0089_PW335_220607, 0089_SW130_220607, 0089_PW364_220607, 0089_PW401_220607, 0089_PW380_220607, 0089_SW382_220607, 0089_PW351_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW363_220607, 0089_QC108_220607, 0089_PW362_220607, 0089_PW340_220607, 0089_PW335_220607, 0089_PW364_220607, 0089_PW380_220607, 0089_PW351_220607, 0089_SW134_220607, 0089_PW341_220607, 0089_QC110_220607, 0089_SW132_220607, 0089_SW130_220607, 0089_PW401_220607, 0089_SW382_220607,	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW363_220607, 0089_QC108_220607, 0089_PW362_220607, 0089_PW340_220607, 0089_PW335_220607, 0089_PW364_220607, 0089_PW380_220607, 0089_PW351_220607, 0089_SW134_220607, 0089_PW341_220607, 0089_QC110_220607, 0089_SW132_220607, 0089_SW130_220607, 0089_PW401_220607, 0089_SW382_220607,	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW363_220607, 0089_QC108_220607, 0089_PW362_220607, 0089_PW340_220607, 0089_PW335_220607, 0089_PW364_220607, 0089_PW380_220607, 0089_PW351_220607, 0089_SW134_220607, 0089_PW341_220607, 0089_QC110_220607, 0089_SW132_220607, 0089_SW130_220607, 0089_PW401_220607, 0089_SW382_220607,	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	35	**11.43**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 38628 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD363		07/06/2022 09:51 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD341		07/06/2022 10:11 AM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD362		07/06/2022 10:46 AM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_SD340		07/06/2022 10:53 AM	Soil	ALS: 1 Non ALS: 0	No	X		
005	0089_SD335		07/06/2022 11:29 AM	Soil	ALS: 1 Non ALS: 0	No	X		
006	0089_QC113		07/06/2022 11:29 AM	Soil	ALS: 1 Non ALS: 0	No	X		
007	0089_SD364		07/06/2022 11:47 AM	Soil	ALS: 1 Non ALS: 0	No	X		
008	0089_SD350		07/06/2022 04:08 PM	Soil	ALS: 1 Non ALS: 0	No	X		
009	0089_SD352		07/06/2022 04:10 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **38628** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD_MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD363	HDPE Soil Jar	200 mL	00620322041498	Grey	No	
002	0089_SD341	HDPE Soil Jar	200 mL	00620322041516	Grey	No	
003	0089_SD362	HDPE Soil Jar	200 mL	00620322041523	Grey	No	
004	0089_SD340	HDPE Soil Jar	200 mL	00620322041517	Grey	No	
005	0089_SD335	HDPE Soil Jar	200 mL	00620322041503	Grey	No	
006	0089_QC113	HDPE Soil Jar	200 mL	00620322041468	Grey	No	
007	0089_SD364	HDPE Soil Jar	200 mL	00620322041531	Grey	No	
008	0089_SD350	HDPE Soil Jar	200 mL	00620322041463	Grey	No	
009	0089_SD352	HDPE Soil Jar	200 mL	00620322041504	Grey	No	

Total Bottle Count: ALS: 9, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206882**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38628	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD_MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2022 12:45	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2206882-001	07-Jun-2022 09:51	0089_SD363_220607	✓	✓
EP2206882-002	07-Jun-2022 10:11	0089_SD341_220607	✓	✓
EP2206882-003	07-Jun-2022 10:46	0089_SD362_220607	✓	✓
EP2206882-004	07-Jun-2022 10:53	0089_SD340_220607	✓	✓
EP2206882-005	07-Jun-2022 11:29	0089_SD335_220607	✓	✓
EP2206882-006	07-Jun-2022 11:29	0089_QC113_220607	✓	✓
EP2206882-007	07-Jun-2022 11:47	0089_SD364_220607	✓	✓
EP2206882-008	07-Jun-2022 16:08	0089_SD350_220607	✓	✓
EP2206882-009	07-Jun-2022 16:10	0089_SD352_220607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206882**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022 12:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2022
C-O-C number	: 38628	Issue Date	: 20-Jun-2022 13:54
Sampler	: [redacted]		
Site	: Stirling SD_MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD363_220607	0089_SD341_220607	0089_SD362_220607	0089_SD340_220607	0089_SD335_220607
				Sampling date / time	07-Jun-2022 09:51	07-Jun-2022 10:11	07-Jun-2022 10:46	07-Jun-2022 10:53	07-Jun-2022 11:29
					EP2206882-001	EP2206882-002	EP2206882-003	EP2206882-004	EP2206882-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**8.9**	**14.2**	**23.1**	**23.3**	**29.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	**0.0003**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD363_220607	0089_SD341_220607	0089_SD362_220607	0089_SD340_220607	0089_SD335_220607
				Sampling date / time	07-Jun-2022 09:51	07-Jun-2022 10:11	07-Jun-2022 10:46	07-Jun-2022 10:53	07-Jun-2022 11:29
Compound	CAS Number	LOR	Unit		EP2206882-001	EP2206882-002	EP2206882-003	EP2206882-004	EP2206882-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	**0.0003**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	**0.0003**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	**0.0003**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**90.0**	**99.5**	**90.0**	**84.0**	**81.0**
13C8-PFOA	----	0.0002	%		**100**	**102**	**104**	**106**	**113**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_QC113_220607	0089_SD364_220607	0089_SD350_220607	0089_SD352_220607	----
			Sampling date / time	07-Jun-2022 11:29	07-Jun-2022 11:47	07-Jun-2022 16:08	07-Jun-2022 16:10	----
Compound	CAS Number	LOR	Unit	EP2206882-006	EP2206882-007	EP2206882-008	EP2206882-009	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**25.4**	**23.8**	**9.9**	**13.5**	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0004**	<0.0002	**0.0006**	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_QC113_220607	0089_SD364_220607	0089_SD350_220607	0089_SD352_220607	----
				Sampling date / time	07-Jun-2022 11:29	07-Jun-2022 11:47	07-Jun-2022 16:08	07-Jun-2022 16:10	----
Compound	CAS Number	LOR	Unit		EP2206882-006	EP2206882-007	EP2206882-008	EP2206882-009	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0004**	<0.0002	**0.0006**	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0004**	<0.0002	**0.0006**	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0004**	<0.0002	**0.0006**	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**76.0**	**95.0**	**93.0**	**77.5**	----
13C8-PFOA	----	0.0002	%		**111**	**118**	**110**	**111**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206882**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2022
C-O-C number	: 38628	Issue Date	: 20-Jun-2022
Sampler	: [redacted]		
Site	: Stirling SD_MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4407145)									
EP2206882-003	0089_SD362_220607	EA055: Moisture Content	----	0.1	%	23.1	23.2	0.0	0% - 20%
EP2206885-005	Anonymous	EA055: Moisture Content	----	0.1	%	20.4	21.6	5.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4401614)									
EP2206882-001	0089_SD363_220607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2206885-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0019	0.0019	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4401614)									
EP2206882-001	0089_SD363_220607	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4401614) - continued									
EP2206882-001	0089_SD363_220607	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2206885-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4401614)									
EP2206882-001	0089_SD363_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2206885-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4401614)									
EP2206882-001	0089_SD363_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2206885-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401614)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401614)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	98.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401614)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	111	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401614)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	98.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	98.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	109	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401614) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	130	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401614)							
EP2206882-001	0089_SD363_220607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	94.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	106	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	104	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	116	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	93.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	104	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401614)							
EP2206882-001	0089_SD363_220607	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	106	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	76.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	116	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	111	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	97.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	107	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	115	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	99.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	110	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401614)							
EP2206882-001	0089_SD363_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	112	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	123	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	111	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	110	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	116	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	114	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401614) - continued							
EP2206882-001	0089_SD363_220607	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	114	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401614)							
EP2206882-001	0089_SD363_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	90.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	96.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	93.2	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	110	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206882**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Site	: Stirling SD_MB	Issue Date	: 20-Jun-2022
Sampler	: [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD363_220607, 0089_SD341_220607, 0089_SD362_220607, 0089_SD340_220607, 0089_SD335_220607, 0089_QC113_220607, 0089_SD364_220607, 0089_SD350_220607, 0089_SD352_220607	**07-Jun-2022**	**----**	----	----	**18-Jun-2022**	21-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD363_220607, 0089_SD341_220607, 0089_SD362_220607, 0089_SD340_220607, 0089_SD335_220607, 0089_QC113_220607, 0089_SD364_220607, 0089_SD350_220607, 0089_SD352_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD363_220607, 0089_SD341_220607, 0089_SD362_220607, 0089_SD340_220607, 0089_SD335_220607, 0089_QC113_220607, 0089_SD364_220607, 0089_SD350_220607, 0089_SD352_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD363_220607, 0089_SD341_220607, 0089_SD362_220607, 0089_SD340_220607, 0089_SD335_220607, 0089_QC113_220607, 0089_SD364_220607, 0089_SD350_220607, 0089_SD352_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD363_220607, 0089_SD341_220607, 0089_SD362_220607, 0089_SD340_220607, 0089_SD335_220607, 0089_QC113_220607, 0089_SD364_220607, 0089_SD350_220607, 0089_SD352_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD363_220607, 0089_SD341_220607, 0089_SD362_220607, 0089_SD340_220607, 0089_SD335_220607, 0089_QC113_220607, 0089_SD364_220607, 0089_SD350_220607, 0089_SD352_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 38630 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW197		07/06/2022 08:38 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW200		07/06/2022 09:19 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_MW199		07/06/2022 10:25 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_QC109		07/06/2022 10:26 AM	Water	ALS: 3 Non ALS: 0	No		X		
005	0089_MW195S		07/06/2022 11:07 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_QC111		07/06/2022 11:08 AM	Water	ALS: 3 Non ALS: 0	No		X		
007	0089_MW195D		07/06/2022 11:22 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_MW193		07/06/2022 11:45 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
009	0089_MW171		07/06/2022 12:36 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

COC#: **38630** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW166		07/06/2022 12:52 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
011	0089_MW158		07/06/2022 01:35 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
012	0089_MW161		07/06/2022 01:12 PM	Water	ALS: 3 Non ALS: 0	No	Partial 3/8			

CHAIN OF CUSTODY

ALS COC#: 38630 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW197	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW200	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW199	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW195S	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW195D	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW193	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW171	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_MW166	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW158	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: **38630** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

012	0089_MW161	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 38630 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW197	HDPE (no PTFE)	20 mL	00350621033725	Grey	No	
001	0089_MW197	HDPE (no PTFE)	20 mL	00350621067690	Grey	No	
001	0089_MW197	Clear Plastic Bottle - Natural	500 mL	00071121102446	Green	No	
002	0089_MW200	Clear Plastic Bottle - Natural	500 mL	00071121102320	Green	No	
002	0089_MW200	HDPE (no PTFE)	20 mL	00350621067654	Grey	No	
002	0089_MW200	HDPE (no PTFE)	20 mL	00350621067826	Grey	No	
003	0089_MW199	Clear Plastic Bottle - Natural	500 mL	00071121102444	Green	No	
003	0089_MW199	HDPE (no PTFE)	20 mL	00350621067970	Grey	No	
003	0089_MW199	HDPE (no PTFE)	20 mL	00350621067873	Grey	No	
004	0089_QC109	Clear Plastic Bottle - Natural	500 mL	00071121102440	Green	No	
004	0089_QC109	HDPE (no PTFE)	20 mL	00350621067880	Grey	No	
004	0089_QC109	HDPE (no PTFE)	20 mL	00350621067747	Grey	No	
005	0089_MW195S	Clear Plastic Bottle - Natural	500 mL	00071121102379	Green	No	
005	0089_MW195S	HDPE (no PTFE)	20 mL	00350621067853	Grey	No	
005	0089_MW195S	HDPE (no PTFE)	20 mL	00350621067664	Grey	No	
006	0089_QC111	Clear Plastic Bottle - Natural	500 mL	00071121102261	Green	No	
006	0089_QC111	HDPE (no PTFE)	20 mL	00350621067430	Grey	No	
006	0089_QC111	HDPE (no PTFE)	20 mL	00350621067393	Grey	No	
007	0089_MW195D	Clear Plastic Bottle - Natural	500 mL	00071121102331	Green	No	
007	0089_MW195D	HDPE (no PTFE)	20 mL	00350621067741	Grey	No	
007	0089_MW195D	HDPE (no PTFE)	20 mL	00350621067732	Grey	No	
008	0089_MW193	Clear Plastic Bottle - Natural	500 mL	00071121102335	Green	No	
008	0089_MW193	HDPE (no PTFE)	20 mL	00350621067908	Grey	No	
008	0089_MW193	HDPE (no PTFE)	20 mL	00350621067834	Grey	No	
009	0089_MW171	Clear Plastic Bottle - Natural	500 mL	00071121102358	Green	No	
009	0089_MW171	HDPE (no PTFE)	20 mL	00350621067907	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 38630 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW171	HDPE (no PTFE)	20 mL	00350621065645	Grey	No	
010	0089_MW166	Clear Plastic Bottle - Natural	500 mL	00071121102362	Green	No	
010	0089_MW166	HDPE (no PTFE)	20 mL	00350621067567	Grey	No	
010	0089_MW166	HDPE (no PTFE)	20 mL	00350621067540	Grey	No	
011	0089_MW158	Clear Plastic Bottle - Natural	500 mL	00071121102265	Green	No	
011	0089_MW158	HDPE (no PTFE)	20 mL	00350621067508	Grey	No	
011	0089_MW158	HDPE (no PTFE)	20 mL	00350621067471	Grey	No	
012	0089_MW161	Clear Plastic Bottle - Natural	500 mL	00071121102245	Green	No	
012	0089_MW161	HDPE (no PTFE)	20 mL	00350621067999	Grey	No	
012	0089_MW161	HDPE (no PTFE)	20 mL	00350621067815	Grey	No	

Total Bottle Count: ALS: 36, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206883**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38630	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2022 12:45	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206883-001	07-Jun-2022 08:38	0089_MW197_220607	✓	✓	✓	✓
EP2206883-002	07-Jun-2022 09:19	0089_MW200_220607	✓	✓	✓	✓
EP2206883-003	07-Jun-2022 10:25	0089_MW199_220607	✓	✓	✓	✓
EP2206883-004	07-Jun-2022 10:26	0089_QC109_220607		✓		
EP2206883-005	07-Jun-2022 11:07	0089_MW195S_220607	✓	✓	✓	✓
EP2206883-006	07-Jun-2022 11:08	0089_QC111_220607		✓		
EP2206883-007	07-Jun-2022 11:22	0089_MW195D_220607	✓	✓	✓	✓
EP2206883-008	07-Jun-2022 11:45	0089_MW193_220607	✓	✓	✓	✓
EP2206883-009	07-Jun-2022 12:36	0089_MW171_220607	✓	✓	✓	✓
EP2206883-010	07-Jun-2022 12:52	0089_MW166_220607	✓	✓	✓	✓
EP2206883-011	07-Jun-2022 13:35	0089_MW158_220607	✓	✓	✓	✓
EP2206883-012	07-Jun-2022 13:12	0089_MW161_220607	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206883**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022 12:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38630	Issue Date	: 17-Jun-2022 19:35
Sampler	: [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW197_220607	0089_MW200_220607	0089_MW199_220607	0089_QC109_220607	0089_MW195S_220607
				Sampling date / time	07-Jun-2022 08:38	07-Jun-2022 09:19	07-Jun-2022 10:25	07-Jun-2022 10:26	07-Jun-2022 11:07
					EP2206883-001	EP2206883-002	EP2206883-003	EP2206883-004	EP2206883-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**441**	**484**	**462**	----	**612**
Total Alkalinity as CaCO3	----	1	mg/L		**441**	**484**	**462**	----	**612**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**119**	**273**	**238**	----	**311**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1190**	**2690**	**2300**	----	**1040**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**78**	**130**	**115**	----	**179**
Magnesium	7439-95-4	1	mg/L		**131**	**141**	**146**	----	**137**
Sodium	7440-23-5	1	mg/L		**610**	**1510**	**1220**	----	**550**
Potassium	7440-09-7	1	mg/L		**42**	**91**	**69**	----	**50**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**44.8**	**91.2**	**79.1**	----	**48.0**
ø Total Cations	----	0.01	meq/L		**42.3**	**86.1**	**72.6**	----	**45.4**
ø Ionic Balance	----	0.01	%		**2.96**	**2.90**	**4.27**	----	**2.81**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW197_220607	0089_MW200_220607	0089_MW199_220607	0089_QC109_220607	0089_MW195S_220607
				Sampling date / time	07-Jun-2022 08:38	07-Jun-2022 09:19	07-Jun-2022 10:25	07-Jun-2022 10:26	07-Jun-2022 11:07
Compound	CAS Number	LOR	Unit		EP2206883-001	EP2206883-002	EP2206883-003	EP2206883-004	EP2206883-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW197_220607	0089_MW200_220607	0089_MW199_220607	0089_QC109_220607	0089_MW195S_220607
				Sampling date / time	07-Jun-2022 08:38	07-Jun-2022 09:19	07-Jun-2022 10:25	07-Jun-2022 10:26	07-Jun-2022 11:07
Compound	CAS Number	LOR	Unit		EP2206883-001	EP2206883-002	EP2206883-003	EP2206883-004	EP2206883-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**78.0**	**98.7**	**95.5**	**98.7**	**99.9**
13C8-PFOA	----	0.02	%		**79.4**	**105**	**97.6**	**102**	**102**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC111_220607	0089_MW195D_220607	0089_MW193_220607	0089_MW171_220607	0089_MW166_220607
				Sampling date / time	07-Jun-2022 11:08	07-Jun-2022 11:22	07-Jun-2022 11:45	07-Jun-2022 12:36	07-Jun-2022 12:52
					EP2206883-006	EP2206883-007	EP2206883-008	EP2206883-009	EP2206883-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	**168**	**651**	**485**	**388**
Total Alkalinity as CaCO3	----	1	mg/L		----	**168**	**651**	**485**	**388**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	**1730**	**56**	**533**	**167**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	**12700**	**538**	**4370**	**828**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	**440**	**111**	**210**	**118**
Magnesium	7439-95-4	1	mg/L		----	**874**	**98**	**375**	**90**
Sodium	7440-23-5	1	mg/L		----	**6120**	**282**	**2460**	**427**
Potassium	7440-09-7	1	mg/L		----	**340**	**26**	**111**	**42**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	**398**	**29.3**	**144**	**34.6**
ø Total Cations	----	0.01	meq/L		----	**369**	**26.5**	**151**	**32.9**
ø Ionic Balance	----	0.01	%		----	**3.76**	**5.03**	**2.41**	**2.43**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.61**	**0.09**	**0.02**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.74**	**0.06**	**0.03**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.01**	**8.14**	**0.24**	**0.77**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	**0.52**	<0.02	**0.20**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.02**	**1.76**	**0.03**	**7.90**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	**0.2**	<0.1	**0.1**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.08**	**0.33**	**0.05**	**0.33**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.07**	**1.50**	**0.14**	**0.30**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC111_220607	0089_MW195D_220607	0089_MW193_220607	0089_MW171_220607	0089_MW166_220607
				Sampling date / time	07-Jun-2022 11:08	07-Jun-2022 11:22	07-Jun-2022 11:45	07-Jun-2022 12:36	07-Jun-2022 12:52
Compound	CAS Number	LOR	Unit		EP2206883-006	EP2206883-007	EP2206883-008	EP2206883-009	EP2206883-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.08**	**0.14**	**0.03**	**0.17**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.60**	<0.01	**0.10**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.02**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC111_220607	0089_MW195D_220607	0089_MW193_220607	0089_MW171_220607	0089_MW166_220607
				Sampling date / time	07-Jun-2022 11:08	07-Jun-2022 11:22	07-Jun-2022 11:45	07-Jun-2022 12:36	07-Jun-2022 12:52
Compound	CAS Number	LOR	Unit		EP2206883-006	EP2206883-007	EP2206883-008	EP2206883-009	EP2206883-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.26**	**14.5**	**0.64**	**9.94**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.03**	**9.90**	**0.27**	**8.67**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.26**	**13.3**	**0.58**	**9.69**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.6**	**113**	**101**	**97.2**	**110**
13C8-PFOA	----	0.02	%		**99.4**	**103**	**101**	**96.4**	**100**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW158_220607	0089_MW161_220607	----	----	----
				Sampling date / time	07-Jun-2022 13:35	07-Jun-2022 13:12	----	----	----
Compound	CAS Number	LOR	Unit		EP2206883-011	EP2206883-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**459**	**498**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**459**	**498**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**445**	**169**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**3940**	**670**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**210**	**93**	----	----	----
Magnesium	7439-95-4	1	mg/L		**320**	**98**	----	----	----
Sodium	7440-23-5	1	mg/L		**2170**	**372**	----	----	----
Potassium	7440-09-7	1	mg/L		**109**	**39**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**130**	**32.4**	----	----	----
ø Total Cations	----	0.01	meq/L		**134**	**29.9**	----	----	----
ø Ionic Balance	----	0.01	%		**1.67**	**3.99**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.05**	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.06**	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.84**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.11**	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**4.21**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.15**	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.23**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.09**	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW158_220607	0089_MW161_220607	----	----	----
				Sampling date / time	07-Jun-2022 13:35	07-Jun-2022 13:12	----	----	----
Compound	CAS Number	LOR	Unit		EP2206883-011	EP2206883-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.09**	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW158_220607	0089_MW161_220607	----	----	----
				Sampling date / time	07-Jun-2022 13:35	07-Jun-2022 13:12	----	----	----
Compound	CAS Number	LOR	Unit		EP2206883-011	EP2206883-012	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**5.83**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**5.05**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**5.66**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.5**	**98.2**	----	----	----
13C8-PFOA	----	0.02	%		**98.4**	**99.6**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206883**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38630	Issue Date	: 17-Jun-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4402871)									
EP2206881-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	126	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	126	1.1	0% - 20%
EP2206883-008	0089_MW193_220607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	651	652	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	651	652	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4393519)									
EP2206881-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2580	1.9	0% - 20%
EP2206883-008	0089_MW193_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	56	56	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4393518)									
EP2206881-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18200	17500	3.5	0% - 20%
EP2206883-008	0089_MW193_220607	ED045G: Chloride	16887-00-6	1	mg/L	538	590	9.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4392200)									
EP2206881-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	490	482	1.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1360	1.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10100	9990	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	587	578	1.6	0% - 20%
EP2206883-008	0089_MW193_220607	ED093F: Calcium	7440-70-2	1	mg/L	111	109	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	98	98	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	282	280	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	26	26	0.0	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4402871)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	101	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393519)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	87.7	113
				<1	500 mg/L	94.0	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4393518)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.1	87.9	114
				<1	1000 mg/L	99.2	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4392200)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	93.1	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	111	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.5	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402449)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	97.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	99.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	105	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402449)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	113	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402449) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	98.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402449)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	112	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	91.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	96.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	107	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402449)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	109	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	116	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	97.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	103	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393519)							
EP2206881-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4393518)							
EP2206881-011	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206883**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Site	: Stirling GW - CG	Issue Date	: 17-Jun-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206881--011	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206881--011	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	20	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	20	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW197_220607, 0089_MW200_220607, 0089_MW199_220607, 0089_MW195S_220607, 0089_MW195D_220607, 0089_MW193_220607, 0089_MW171_220607, 0089_MW166_220607, 0089_MW158_220607, 0089_MW161_220607	**07-Jun-2022**	**----**	----	----	**16-Jun-2022**	21-Jun-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW197_220607, 0089_MW200_220607, 0089_MW199_220607, 0089_MW195S_220607, 0089_MW195D_220607, 0089_MW193_220607, 0089_MW171_220607, 0089_MW166_220607, 0089_MW158_220607, 0089_MW161_220607	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW197_220607, 0089_MW200_220607, 0089_MW199_220607, 0089_MW195S_220607, 0089_MW195D_220607, 0089_MW193_220607, 0089_MW171_220607, 0089_MW166_220607, 0089_MW158_220607, 0089_MW161_220607	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW197_220607, 0089_MW200_220607, 0089_MW199_220607, 0089_MW195S_220607, 0089_MW195D_220607, 0089_MW193_220607, 0089_MW171_220607, 0089_MW166_220607, 0089_MW158_220607, 0089_MW161_220607	**07-Jun-2022**	**----**	----	----	**10-Jun-2022**	14-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW197_220607, 0089_MW200_220607, 0089_MW199_220607, 0089_QC109_220607, 0089_MW195S_220607, 0089_QC111_220607, 0089_MW195D_220607, 0089_MW193_220607, 0089_MW171_220607, 0089_MW166_220607, 0089_MW158_220607, 0089_MW161_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW197_220607, 0089_MW200_220607, 0089_MW199_220607, 0089_QC109_220607, 0089_MW195S_220607, 0089_QC111_220607, 0089_MW195D_220607, 0089_MW193_220607, 0089_MW171_220607, 0089_MW166_220607, 0089_MW158_220607, 0089_MW161_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW197_220607, 0089_MW199_220607, 0089_MW195S_220607, 0089_MW195D_220607, 0089_MW171_220607, 0089_MW158_220607, 0089_MW200_220607, 0089_QC109_220607, 0089_QC111_220607, 0089_MW193_220607, 0089_MW166_220607, 0089_MW161_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW197_220607, 0089_MW199_220607, 0089_MW195S_220607, 0089_MW195D_220607, 0089_MW171_220607, 0089_MW158_220607, 0089_MW200_220607, 0089_QC109_220607, 0089_QC111_220607, 0089_MW193_220607, 0089_MW166_220607, 0089_MW161_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW197_220607, 0089_MW199_220607, 0089_MW195S_220607, 0089_MW195D_220607, 0089_MW171_220607, 0089_MW158_220607, 0089_MW200_220607, 0089_QC109_220607, 0089_QC111_220607, 0089_MW193_220607, 0089_MW166_220607, 0089_MW161_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **38631** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW369		07/06/2022 08:58 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW345		07/06/2022 09:11 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_SW370		07/06/2022 09:28 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_PW367		07/06/2022 09:38 AM	Water	ALS: 3 Non ALS: 0	No	Partial 3/8		
005	0089_PW350		07/06/2022 04:16 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW352		07/06/2022 04:17 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW381		07/06/2022 04:19 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_SW384		07/06/2022 04:20 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_SW383		07/06/2022 04:21 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: 38631 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW353		07/06/2022 04:22 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 38631 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW369	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW345	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW370	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW367	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW350	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW352	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW381	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_SW384	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_SW383	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **38631** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_SW353	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **38631** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW369	Clear Plastic Bottle - Natural	500 mL	00071121102400	Green	No	
001	0089_PW369	HDPE (no PTFE)	20 mL	00350621067843	Grey	No	
001	0089_PW369	HDPE (no PTFE)	20 mL	00350621067832	Grey	No	
002	0089_PW345	Clear Plastic Bottle - Natural	500 mL	00071121102237	Green	No	
002	0089_PW345	HDPE (no PTFE)	20 mL	00350621067507	Grey	No	
002	0089_PW345	HDPE (no PTFE)	20 mL	00350621067720	Grey	No	
003	0089_SW370	Clear Plastic Bottle - Natural	500 mL	00071121102360	Green	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00350621067713	Grey	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00350621067833	Grey	No	
004	0089_PW367	Clear Plastic Bottle - Natural	500 mL	00071121102323	Green	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00350621067655	Grey	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00350621068014	Grey	No	
005	0089_PW350	Clear Plastic Bottle - Natural	500 mL	00071121102373	Green	No	
005	0089_PW350	HDPE (no PTFE)	20 mL	00350621067858	Grey	No	
005	0089_PW350	HDPE (no PTFE)	20 mL	00350621067776	Grey	No	
006	0089_PW352	Clear Plastic Bottle - Natural	500 mL	00071121102240	Green	No	
006	0089_PW352	HDPE (no PTFE)	20 mL	00350621067681	Grey	No	
006	0089_PW352	HDPE (no PTFE)	20 mL	00350621067874	Grey	No	
007	0089_PW381	Clear Plastic Bottle - Natural	500 mL	00071121102355	Green	No	
007	0089_PW381	HDPE (no PTFE)	20 mL	00350621067959	Grey	No	
007	0089_PW381	HDPE (no PTFE)	20 mL	00350621068004	Grey	No	
008	0089_SW384	Clear Plastic Bottle - Natural	500 mL	00071121102313	Green	No	
008	0089_SW384	HDPE (no PTFE)	20 mL	00350621067926	Grey	No	
008	0089_SW384	HDPE (no PTFE)	20 mL	00350621067772	Grey	No	
009	0089_SW383	Clear Plastic Bottle - Natural	500 mL	00071121102380	Green	No	
009	0089_SW383	HDPE (no PTFE)	20 mL	00350621033716	Grey	No	

CHAIN OF CUSTODY

COC#: 38631 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_SW383	HDPE (no PTFE)	20 mL	00350621067966	Grey	No	
010	0089_SW353	Clear Plastic Bottle - Natural	500 mL	00071121102242	Green	No	
010	0089_SW353	HDPE (no PTFE)	20 mL	00350621067946	Grey	No	
010	0089_SW353	HDPE (no PTFE)	20 mL	00350621067692	Grey	No	

Total Bottle Count: ALS: 30, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206884**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38631	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2022 12:45	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analyis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206884-001	07-Jun-2022 08:58	0089_PW369_220607	✓	✓	✓	✓
EP2206884-002	07-Jun-2022 09:11	0089_PW345_220607	✓	✓	✓	✓
EP2206884-003	07-Jun-2022 09:28	0089_SW370_220607	✓	✓	✓	✓
EP2206884-004	07-Jun-2022 09:38	0089_PW367_220607	✓	✓	✓	✓
EP2206884-005	07-Jun-2022 16:16	0089_PW350_220607	✓	✓	✓	✓
EP2206884-006	07-Jun-2022 16:17	0089_PW352_220607	✓	✓	✓	✓
EP2206884-007	07-Jun-2022 16:19	0089_PW381_220607	✓	✓	✓	✓
EP2206884-008	07-Jun-2022 16:20	0089_SW384_220607	✓	✓	✓	✓
EP2206884-009	07-Jun-2022 16:21	0089_SW383_220607	✓	✓	✓	✓
EP2206884-010	07-Jun-2022 16:22	0089_SW353_220607	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206884**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022 12:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38631	Issue Date	: 20-Jun-2022 14:25
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analyis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- ED041G (Sulfate - Turbidimetric): sample EP2206884-008 was re-filtered and re-analyzed from parent sample to confirm results.
- ED045G (Chloride): sample EP2206884-008 was re-filtered and re-analyzed from parent sample to confirm results.
- EP231X: Positive result for analyte Perfluorooctane sulfonic acid (PFOS) and on sample EP2206884_006 has been confirmed by re-extraction and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW369_220607	0089_PW345_220607	0089_SW370_220607	0089_PW367_220607	0089_PW350_220607
				Sampling date / time	07-Jun-2022 08:58	07-Jun-2022 09:11	07-Jun-2022 09:28	07-Jun-2022 09:38	07-Jun-2022 16:16
Compound	CAS Number	LOR	Unit		EP2206884-001	EP2206884-002	EP2206884-003	EP2206884-004	EP2206884-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		139	131	126	129	124
Total Alkalinity as CaCO3	----	1	mg/L		139	131	126	129	124
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2510	2510	2480	2620	2770
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18600	21400	18100	18600	17900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		479	473	444	459	442
Magnesium	7439-95-4	1	mg/L		1470	1430	1350	1370	1350
Sodium	7440-23-5	1	mg/L		10800	10600	10000	10300	9950
Potassium	7440-09-7	1	mg/L		602	594	555	567	568
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		580	658	565	582	565
ø Total Cations	----	0.01	meq/L		630	618	582	598	580
ø Ionic Balance	----	0.01	%		4.16	3.21	1.54	1.39	1.34
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.03	0.03	0.02	0.03	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.17	0.47	0.11	0.27	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW369_220607	0089_PW345_220607	0089_SW370_220607	0089_PW367_220607	0089_PW350_220607
				Sampling date / time	07-Jun-2022 08:58	07-Jun-2022 09:11	07-Jun-2022 09:28	07-Jun-2022 09:38	07-Jun-2022 16:16
Compound	CAS Number	LOR	Unit		EP2206884-001	EP2206884-002	EP2206884-003	EP2206884-004	EP2206884-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW369_220607	0089_PW345_220607	0089_SW370_220607	0089_PW367_220607	0089_PW350_220607
				Sampling date / time	07-Jun-2022 08:58	07-Jun-2022 09:11	07-Jun-2022 09:28	07-Jun-2022 09:38	07-Jun-2022 16:16
Compound	CAS Number	LOR	Unit		EP2206884-001	EP2206884-002	EP2206884-003	EP2206884-004	EP2206884-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.20**	**0.50**	**0.13**	**0.30**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.20**	**0.50**	**0.13**	**0.30**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.20**	**0.50**	**0.13**	**0.30**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**95.8**	**98.0**	**104**	**102**
13C8-PFOA	----	0.02	%		**102**	**96.7**	**99.9**	**102**	**97.9**

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW352_220607	0089_PW381_220607	0089_SW384_220607	0089_SW383_220607	0089_SW353_220607
				Sampling date / time	07-Jun-2022 16:17	07-Jun-2022 16:19	07-Jun-2022 16:20	07-Jun-2022 16:21	07-Jun-2022 16:22
					EP2206884-006	EP2206884-007	EP2206884-008	EP2206884-009	EP2206884-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**125**	**124**	**123**	**124**	**125**
Total Alkalinity as CaCO3	----	1	mg/L		**125**	**124**	**123**	**124**	**125**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2720**	**2440**	**2910**	**2650**	**2470**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17200**	**17600**	**19200**	**17400**	**16800**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**427**	**481**	**452**	**485**	**490**
Magnesium	7439-95-4	1	mg/L		**1300**	**1480**	**1400**	**1490**	**1500**
Sodium	7440-23-5	1	mg/L		**9600**	**11000**	**10400**	**11000**	**11000**
Potassium	7440-09-7	1	mg/L		**535**	**615**	**581**	**620**	**624**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**544**	**550**	**605**	**548**	**528**
ø Total Cations	----	0.01	meq/L		**560**	**640**	**605**	**641**	**642**
ø Ionic Balance	----	0.01	%		**1.38**	**7.59**	**0.03**	**7.79**	**9.78**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW352_220607	0089_PW381_220607	0089_SW384_220607	0089_SW383_220607	0089_SW353_220607
				Sampling date / time	07-Jun-2022 16:17	07-Jun-2022 16:19	07-Jun-2022 16:20	07-Jun-2022 16:21	07-Jun-2022 16:22
Compound	CAS Number	LOR	Unit		EP2206884-006	EP2206884-007	EP2206884-008	EP2206884-009	EP2206884-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW352_220607	0089_PW381_220607	0089_SW384_220607	0089_SW383_220607	0089_SW353_220607
				Sampling date / time	07-Jun-2022 16:17	07-Jun-2022 16:19	07-Jun-2022 16:20	07-Jun-2022 16:21	07-Jun-2022 16:22
Compound	CAS Number	LOR	Unit		EP2206884-006	EP2206884-007	EP2206884-008	EP2206884-009	EP2206884-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.8**	**99.9**	**102**	**97.9**	**93.7**
13C8-PFOA	----	0.02	%		**102**	**96.7**	**99.7**	**98.8**	**100**

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206884**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38631	Issue Date	: 20-Jun-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4402871)									
EP2206881-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	126	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	126	1.1	0% - 20%
EP2206883-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	651	652	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	651	652	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4402872)									
EP2206884-006	0089_PW352_220607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	124	0.0	0% - 20%
EP2206888-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	515	514	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	515	514	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4393519)									
EP2206881-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2580	1.9	0% - 20%
EP2206883-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	56	56	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4393524)									
EP2206884-006	0089_PW352_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2720	2770	1.7	0% - 20%
EP2206888-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	302	299	0.9	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 4393518)									
EP2206881-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18200	17500	3.5	0% - 20%
EP2206883-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	538	590	9.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4393523)									
EP2206884-006	0089_PW352_220607	ED045G: Chloride	16887-00-6	1	mg/L	17200	17600	2.3	0% - 20%
EP2206888-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1260	1260	0.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4392204)									
EP2206884-001	0089_PW369_220607	ED093F: Calcium	7440-70-2	1	mg/L	479	457	4.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1380	6.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	10200	5.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	602	564	6.5	0% - 20%
EP2206888-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	231	226	2.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	78	76	1.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	447	443	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2206970-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.09	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4402594) - continued									
EP2206970-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2206970-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4402594) - continued									
EP2206969-001	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2206970-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2206970-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.10	0.11	9.5	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4402871)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	101	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4402872)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	81.2	126
				<1	200 mg/L	100	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393519)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	87.7	113
				<1	500 mg/L	94.0	87.7	113
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393524)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	87.7	113
				<1	500 mg/L	103	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4393518)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.1	87.9	114
				<1	1000 mg/L	99.2	87.9	114
ED045G: Chloride by Discrete Analyser (QCLot: 4393523)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	87.9	114
				<1	1000 mg/L	92.6	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4392204)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	109	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.0	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	112	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402449)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	97.0	68.0	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402449) - continued								
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	99.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	105	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402594)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	112	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402449)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	113	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	98.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402594)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	118	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	122	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	114	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402449)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	112	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	91.0	62.6	147

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402449) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	96.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	107	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	98.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402594)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	106	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402449)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	109	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	116	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	97.0	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	103	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402594)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	121	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	125	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	117	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	142	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393519)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393519) - continued							
EP2206881-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393524)							
EP2206884-006	0089_PW352_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4393518)							
EP2206881-011	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4393523)							
EP2206884-006	0089_PW352_220607	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402594)							
EP2206970-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	99.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	107	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	98.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	111	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402594)							
EP2206970-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	114	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	109	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	114	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	119	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	115	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	110	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	119	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	123	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	97.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402594)							
EP2206970-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	104	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	112	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.0	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	96.1	66.0	145

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402594) - continued							
EP2206970-003	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	112	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	109	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402594)							
EP2206970-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	106	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	128	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	99.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	128	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206884**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Site	: Stirling SW/PW - CG	Issue Date	: 20-Jun-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206881--011	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206884--006	0089_PW352_220607	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206881--011	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206884--006	0089_PW352_220607	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	39	5.13	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	39	2.56	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / *Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation* ***Date extracted***	*Due for extraction*	*Evaluation*	*Analysis* ***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW369_220607, 0089_PW345_220607, 0089_SW370_220607, 0089_PW367_220607, 0089_PW350_220607, 0089_PW352_220607, 0089_PW381_220607, 0089_SW384_220607, 0089_SW383_220607, 0089_SW353_220607	**07-Jun-2022**	**----**	----	----	**16-Jun-2022**	21-Jun-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW352_220607, 0089_PW381_220607, 0089_SW384_220607, 0089_SW383_220607, 0089_SW353_220607	**07-Jun-2022**	**----**	----	----	**14-Jun-2022**	05-Jul-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_PW369_220607, 0089_PW345_220607, 0089_SW370_220607, 0089_PW367_220607, 0089_PW350_220607	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW352_220607, 0089_PW381_220607, 0089_SW384_220607, 0089_SW383_220607, 0089_SW353_220607	**07-Jun-2022**	**----**	----	----	**14-Jun-2022**	05-Jul-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_PW369_220607, 0089_PW345_220607, 0089_SW370_220607, 0089_PW367_220607, 0089_PW350_220607	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW369_220607, 0089_PW345_220607, 0089_SW370_220607, 0089_PW367_220607, 0089_PW350_220607, 0089_PW352_220607, 0089_PW381_220607, 0089_SW384_220607, 0089_SW383_220607, 0089_SW353_220607	**07-Jun-2022**	**----**	----	----	**10-Jun-2022**	14-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW369_220607, 0089_PW345_220607, 0089_SW370_220607, 0089_PW367_220607, 0089_PW350_220607, 0089_PW352_220607, 0089_PW381_220607, 0089_SW384_220607, 0089_SW383_220607, 0089_SW353_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW369_220607, 0089_PW345_220607, 0089_SW370_220607, 0089_PW367_220607, 0089_PW350_220607, 0089_PW352_220607, 0089_PW381_220607, 0089_SW384_220607, 0089_SW383_220607, 0089_SW353_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW369_220607, 0089_PW345_220607, 0089_SW370_220607, 0089_PW367_220607, 0089_PW350_220607, 0089_PW352_220607, 0089_PW381_220607, 0089_SW384_220607, 0089_SW383_220607, 0089_SW353_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW369_220607, 0089_PW345_220607, 0089_SW370_220607, 0089_PW367_220607, 0089_PW350_220607, 0089_PW352_220607, 0089_PW381_220607, 0089_SW384_220607, 0089_SW383_220607, 0089_SW353_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW369_220607, 0089_PW345_220607, 0089_SW370_220607, 0089_PW367_220607, 0089_PW350_220607, 0089_PW352_220607, 0089_PW381_220607, 0089_SW384_220607, 0089_SW383_220607, 0089_SW353_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**16-Jun-2022**	04-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	39	**2.56**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 38632 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD369	QC106	07/06/2022 08:51 AM	Soil	ALS: 1 Non ALS: 0	No	X		QC106
002	0089_QC106		07/06/2022 08:52 AM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD345		07/06/2022 09:08 AM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_SD367		07/06/2022 09:35 AM	Soil	ALS: 1 Non ALS: 0	No	X		
005	0089_SD351		07/06/2022 04:24 PM	Soil	ALS: 1 Non ALS: 0	No	X		
006	0089_SD380		07/06/2022 04:24 PM	Soil	ALS: 1 Non ALS: 0	No	X		
007	0089_SD381		07/06/2022 04:25 PM	Soil	ALS: 1 Non ALS: 0	No	X		
008	0089_SD401		07/06/2022 04:25 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **38632** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD369	HDPE Soil Jar	200 mL	00620322041483	Grey	No	
002	0089_QC106	HDPE Soil Jar	200 mL	00620322041396	Grey	No	
003	0089_SD345	HDPE Soil Jar	200 mL	00620322041522	Grey	No	
004	0089_SD367	HDPE Soil Jar	200 mL	00620322041515	Grey	No	
005	0089_SD351	HDPE Soil Jar	200 mL	00620322041529	Grey	No	
006	0089_SD380	HDPE Soil Jar	200 mL	00620322041493	Grey	No	
007	0089_SD381	HDPE Soil Jar	200 mL	00620322041454	Grey	No	
008	0089_SD401	HDPE Soil Jar	200 mL	00620322041502	Grey	No	

Total Bottle Count: ALS: 8, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206885**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38632	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2022 12:45	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP2206885-001 : 07-Jun-2022 08:51 : 0089_SD369_220607 - QC106

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2206885-001	07-Jun-2022 08:51	0089_SD369_220607 Q...	✓	✓
EP2206885-002	07-Jun-2022 08:52	0089_QC106_220607	✓	✓
EP2206885-003	07-Jun-2022 09:08	0089_SD345_220607	✓	✓
EP2206885-004	07-Jun-2022 09:35	0089_SD367_220607	✓	✓
EP2206885-005	07-Jun-2022 16:24	0089_SD351_220607	✓	✓
EP2206885-006	07-Jun-2022 16:24	0089_SD380_220607	✓	✓
EP2206885-007	07-Jun-2022 16:25	0089_SD381_220607	✓	✓
EP2206885-008	07-Jun-2022 16:25	0089_SD401_220607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206885**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022 12:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2022
C-O-C number	: 38632	Issue Date	: 21-Jun-2022 11:08
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X: PFAS results for sample #4, #8 confirmed by re-extraction and re-analysis
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD369_220607 QC106	0089_QC106_220607	0089_SD345_220607	0089_SD367_220607	0089_SD351_220607
				Sampling date / time	07-Jun-2022 08:51	07-Jun-2022 08:52	07-Jun-2022 09:08	07-Jun-2022 09:35	07-Jun-2022 16:24
					EP2206885-001	EP2206885-002	EP2206885-003	EP2206885-004	EP2206885-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**21.0**	**20.7**	**29.4**	**26.9**	**20.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0021**	**0.0019**	**0.0007**	**0.0008**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD369_220607 QC106	0089_QC106_220607	0089_SD345_220607	0089_SD367_220607	0089_SD351_220607
				Sampling date / time	07-Jun-2022 08:51	07-Jun-2022 08:52	07-Jun-2022 09:08	07-Jun-2022 09:35	07-Jun-2022 16:24
Compound	CAS Number	LOR	Unit		EP2206885-001	EP2206885-002	EP2206885-003	EP2206885-004	EP2206885-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0021**	**0.0019**	**0.0007**	**0.0008**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0021**	**0.0019**	**0.0007**	**0.0008**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0021**	**0.0019**	**0.0007**	**0.0008**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**81.0**	**85.0**	**104**	**92.0**	**97.5**
13C8-PFOA	----	0.0002	%		**118**	**116**	**103**	**100**	**98.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD380_220607	0089_SD381_220607	0089_SD401_220607	----	----
			Sampling date / time	07-Jun-2022 16:24	07-Jun-2022 16:25	07-Jun-2022 16:25	----	----
Compound	CAS Number	LOR	Unit	EP2206885-006	EP2206885-007	EP2206885-008	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**21.7**	**16.4**	**18.6**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	**0.0003**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD380_220607	0089_SD381_220607	0089_SD401_220607	----	----
			Sampling date / time	07-Jun-2022 16:24	07-Jun-2022 16:25	07-Jun-2022 16:25	----	----
Compound	CAS Number	LOR	Unit	EP2206885-006	EP2206885-007	EP2206885-008	--------	--------
				Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	**0.0003**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	**0.0003**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	**0.0003**	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**109**	**112**	**97.5**	----	----
13C8-PFOA	----	0.0002	%	**106**	**108**	**100**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206885**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2022
C-O-C number	: 38632	Issue Date	: 21-Jun-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4407145)									
EP2206882-003	Anonymous	EA055: Moisture Content	----	0.1	%	23.1	23.2	0.0	0% - 20%
EP2206885-005	0089_SD351_220607	EA055: Moisture Content	----	0.1	%	20.4	21.6	5.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4401614)									
EP2206882-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2206885-002	0089_QC106_220607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0019	0.0019	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4401616)									
EP2206885-003	0089_SD345_220607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0007	0.0009	15.8	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2206886-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4401616) - continued									
EP2206886-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4401614)									
EP2206882-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2206885-002	0089_QC106_220607	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4401616)									
EP2206885-003	0089_SD345_220607	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2206886-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4401616) - continued									
EP2206886-005	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4401614)									
EP2206882-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2206885-002	0089_QC106_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4401616)									
EP2206885-003	0089_SD345_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4401616) - continued									
EP2206885-003	0089_SD345_220607	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2206886-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4401614)									
EP2206882-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2206885-002	0089_QC106_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4401616)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4401616) - continued									
EP2206885-003	0089_SD345_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2206886-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401614)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401616)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401614)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	98.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401616)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	105	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	64.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401616) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401614)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	111	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401616)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	122	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	130	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401614)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	98.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	98.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	109	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	130	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401616)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	97.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	87.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	125	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	140	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401614)							
EP2206882-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	94.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	106	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	104	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	116	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	93.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	104	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401616)							
EP2206885-003	0089_SD345_220607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	100	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	100	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	98.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	94.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	94.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	101	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401614)							
EP2206882-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	106	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	76.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	116	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	111	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	97.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	107	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	115	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	99.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	110	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401616)							
EP2206885-003	0089_SD345_220607	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	104	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	108	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	110	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	100	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	111	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	106	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	108	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401616) - continued							
EP2206885-003	0089_SD345_220607	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	116	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	126	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401614)							
EP2206882-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	112	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	123	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	111	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	110	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	116	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	114	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	114	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401616)							
EP2206885-003	0089_SD345_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	105	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	114	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	109	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	110	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	106	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	119	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	90.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401614)							
EP2206882-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	90.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	96.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	93.2	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	110	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401616)							
EP2206885-003	0089_SD345_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	98.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	110	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	108	65.0	137

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401616) - continued							
EP2206885-003	0089_SD345_220607	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	113	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206885**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Site	: Stirling SD - CG	Issue Date	: 21-Jun-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 8
Order number	: pfas-omp/Stirling	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD369_220607 - QC106,	0089_QC106_220607,	**07-Jun-2022**	**----**	----	----	**18-Jun-2022**	21-Jun-2022	✓
0089_SD345_220607,	0089_SD367_220607,							
0089_SD351_220607,	0089_SD380_220607,							
0089_SD381_220607,	0089_SD401_220607							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD369_220607 - QC106,	0089_QC106_220607,	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
0089_SD345_220607,	0089_SD367_220607,							
0089_SD351_220607,	0089_SD380_220607,							
0089_SD381_220607,	0089_SD401_220607							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD369_220607 - QC106,	0089_QC106_220607,	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
0089_SD345_220607,	0089_SD367_220607,							
0089_SD351_220607,	0089_SD380_220607,							
0089_SD381_220607,	0089_SD401_220607							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD369_220607 - QC106,	0089_QC106_220607,	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
0089_SD345_220607,	0089_SD367_220607,							
0089_SD351_220607,	0089_SD380_220607,							
0089_SD381_220607,	0089_SD401_220607							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD369_220607 - QC106,	0089_QC106_220607,	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
0089_SD345_220607,	0089_SD367_220607,							
0089_SD351_220607,	0089_SD380_220607,							
0089_SD381_220607,	0089_SD401_220607							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD369_220607 - QC106, 0089_QC106_220607, 0089_SD345_220607, 0089_SD367_220607, 0089_SD351_220607, 0089_SD380_220607, 0089_SD381_220607, 0089_SD401_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 38642 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD316		07/06/2022 08:38 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD308		07/06/2022 08:38 AM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD306		07/06/2022 08:38 AM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_SD314		07/06/2022 08:39 AM	Soil	ALS: 1 Non ALS: 0	No	X		
005	0089_SD307		07/06/2022 08:39 AM	Soil	ALS: 1 Non ALS: 0	No	X		
006	0089_SD315		07/06/2022 08:39 AM	Soil	ALS: 1 Non ALS: 0	No	X		
007	0089_QC102		07/06/2022 08:40 AM	Soil	ALS: 1 Non ALS: 0	No	X		
008	0089_SD407		07/06/2022 12:07 PM	Soil	ALS: 1 Non ALS: 0	No	X		
009	0089_QC114		07/06/2022 12:08 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 38642 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SD405		07/06/2022 12:30 PM	Soil	ALS: 1 Non ALS: 0	No	X		
011	0089_SD409		07/06/2022 01:35 PM	Soil	ALS: 1 Non ALS: 0	No	X		
012	0089_SD413		07/06/2022 01:53 PM	Soil	ALS: 1 Non ALS: 0	No	X		
013	0089_SD415		07/06/2022 01:55 PM	Soil	ALS: 1 Non ALS: 0	No	X		
014	0089_SD411		07/06/2022 01:56 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 38642 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD316	HDPE Soil Jar	200 mL	00620322041398	Grey	No	
002	0089_SD308	HDPE Soil Jar	200 mL	00620322041476	Grey	No	
003	0089_SD306	HDPE Soil Jar	200 mL	00620322041470	Grey	No	
004	0089_SD314	HDPE Soil Jar	200 mL	00620322041425	Grey	No	
005	0089_SD307	HDPE Soil Jar	200 mL	00620322041486	Grey	No	
006	0089_SD315	HDPE Soil Jar	200 mL	00620322041436	Grey	No	
007	0089_QC102	HDPE Soil Jar	200 mL	00620322041471	Grey	No	
008	0089_SD407	HDPE Soil Jar	200 mL	00620322041422	Grey	No	
009	0089_QC114	HDPE Soil Jar	200 mL	00620322041519	Grey	No	
010	0089_SD405	HDPE Soil Jar	200 mL	00620322041404	Grey	No	
011	0089_SD409	HDPE Soil Jar	200 mL	00620322041400	Grey	No	
012	0089_SD413	HDPE Soil Jar	200 mL	00620322041420	Grey	No	
013	0089_SD415	HDPE Soil Jar	200 mL	00620322041532	Grey	No	
014	0089_SD411	HDPE Soil Jar	200 mL	00620322041458	Grey	No	

Total Bottle Count: ALS: 14, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2206886**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38642	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2022 12:45	Issue Date	: 13-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 14 / 14

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2206886-001	07-Jun-2022 08:38	0089_SD316_220607	✓	✓
EP2206886-002	07-Jun-2022 08:38	0089_SD308_220607	✓	✓
EP2206886-003	07-Jun-2022 08:38	0089_SD306_220607	✓	✓
EP2206886-004	07-Jun-2022 08:39	0089_SD314_220607	✓	✓
EP2206886-005	07-Jun-2022 08:39	0089_SD307_220607	✓	✓
EP2206886-006	07-Jun-2022 08:39	0089_SD315_220607	✓	✓
EP2206886-007	07-Jun-2022 08:40	0089_QC102_220607	✓	✓
EP2206886-008	07-Jun-2022 12:07	0089_SD407_220607	✓	✓
EP2206886-009	07-Jun-2022 12:08	0089_QC114_220607	✓	✓
EP2206886-010	07-Jun-2022 12:30	0089_SD405_220607	✓	✓
EP2206886-011	07-Jun-2022 13:35	0089_SD409_220607	✓	✓
EP2206886-012	07-Jun-2022 13:53	0089_SD413_220607	✓	✓
EP2206886-013	07-Jun-2022 13:55	0089_SD415_220607	✓	✓
EP2206886-014	07-Jun-2022 13:56	0089_SD411_220607	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206886**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022 12:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2022
C-O-C number	: 38642	Issue Date	: 21-Jun-2022 11:09
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD316_220607	0089_SD308_220607	0089_SD306_220607	0089_SD314_220607	0089_SD307_220607
				Sampling date / time	07-Jun-2022 08:38	07-Jun-2022 08:38	07-Jun-2022 08:38	07-Jun-2022 08:39	07-Jun-2022 08:39
					EP2206886-001	EP2206886-002	EP2206886-003	EP2206886-004	EP2206886-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**23.6**	**20.2**	**22.9**	**22.3**	**19.1**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD316_220607	0089_SD308_220607	0089_SD306_220607	0089_SD314_220607	0089_SD307_220607
				Sampling date / time	07-Jun-2022 08:38	07-Jun-2022 08:38	07-Jun-2022 08:38	07-Jun-2022 08:39	07-Jun-2022 08:39
Compound	CAS Number	LOR	Unit		EP2206886-001	EP2206886-002	EP2206886-003	EP2206886-004	EP2206886-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**91.5**	**102**	**105**	**99.5**	**104**
13C8-PFOA	----	0.0002	%		**97.0**	**106**	**104**	**102**	**104**

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD315_220607	0089_QC102_220607	0089_SD407_220607	0089_QC114_220607	0089_SD405_220607
				Sampling date / time	07-Jun-2022 08:39	07-Jun-2022 08:40	07-Jun-2022 12:07	07-Jun-2022 12:08	07-Jun-2022 12:30
					EP2206886-006	EP2206886-007	EP2206886-008	EP2206886-009	EP2206886-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**26.6**	**20.7**	**30.0**	**27.8**	**25.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD315_220607	0089_QC102_220607	0089_SD407_220607	0089_QC114_220607	0089_SD405_220607
				Sampling date / time	07-Jun-2022 08:39	07-Jun-2022 08:40	07-Jun-2022 12:07	07-Jun-2022 12:08	07-Jun-2022 12:30
Compound	CAS Number	LOR	Unit		EP2206886-006	EP2206886-007	EP2206886-008	EP2206886-009	EP2206886-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	**111**	**101**	**117**	**100**
13C8-PFOA	----	0.0002	%		**103**	**104**	**102**	**100**	**106**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD409_220607	0089_SD413_220607	0089_SD415_220607	0089_SD411_220607	----
			Sampling date / time	07-Jun-2022 13:35	07-Jun-2022 13:53	07-Jun-2022 13:55	07-Jun-2022 13:56	----
Compound	CAS Number	LOR	Unit	EP2206886-011	EP2206886-012	EP2206886-013	EP2206886-014	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**24.0**	**25.6**	**18.8**	**19.8**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD409_220607	0089_SD413_220607	0089_SD415_220607	0089_SD411_220607	----
			Sampling date / time	07-Jun-2022 13:35	07-Jun-2022 13:53	07-Jun-2022 13:55	07-Jun-2022 13:56	----
Compound	CAS Number	LOR	Unit	EP2206886-011	EP2206886-012	EP2206886-013	EP2206886-014	--------
				Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**100**	**102**	**97.0**	**113**	----
13C8-PFOA	----	0.0002	%	**104**	**104**	**100**	**105**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206886**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 16-Jun-2022
C-O-C number	: 38642	Issue Date	: 21-Jun-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4407145)									
EP2206882-003	Anonymous	EA055: Moisture Content	----	0.1	%	23.1	23.2	0.0	0% - 20%
EP2206885-005	Anonymous	EA055: Moisture Content	----	0.1	%	20.4	21.6	5.4	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4407146)									
EP2206886-006	0089_SD315_220607	EA055: Moisture Content	----	0.1	%	26.6	26.7	0.0	0% - 20%
EP2206968-003	Anonymous	EA055: Moisture Content	----	0.1	%	20.4	19.3	5.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4401616)									
EP2206885-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0007	0.0009	15.8	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2206886-005	0089_SD307_220607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4401616)									
EP2206885-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4401616) - continued									
EP2206885-003	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2206886-005	0089_SD307_220607	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4401616)									
EP2206885-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2206886-005	0089_SD307_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4401616) - continued									
EP2206886-005	0089_SD307_220607	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4401616)									
EP2206885-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2206886-005	0089_SD307_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401616)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401616)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	105	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401616)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	122	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	130	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401616)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	97.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	87.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	125	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401616) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	140	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4401616)							
EP2206885-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	100	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	100	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	98.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	94.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	94.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	101	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4401616)							
EP2206885-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	104	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	108	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	110	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	100	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	111	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	106	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	108	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	116	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	126	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401616)							
EP2206885-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	105	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	114	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	109	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	110	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	106	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	119	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4401616) - continued							
EP2206885-003	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	90.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4401616)							
EP2206885-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	98.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	110	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	108	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	113	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206886**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Site	: Stirling SD - AG	Issue Date	: 21-Jun-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 14
Order number	: pfas-omp/Stirling	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD316_220607, 0089_SD308_220607, 0089_SD306_220607, 0089_SD314_220607, 0089_SD307_220607, 0089_SD315_220607, 0089_QC102_220607, 0089_SD407_220607, 0089_QC114_220607, 0089_SD405_220607, 0089_SD409_220607, 0089_SD413_220607, 0089_SD415_220607, 0089_SD411_220607	**07-Jun-2022**	**----**	----	----	**18-Jun-2022**	21-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD316_220607, 0089_SD308_220607, 0089_SD306_220607, 0089_SD314_220607, 0089_SD307_220607, 0089_SD315_220607, 0089_QC102_220607, 0089_SD407_220607, 0089_QC114_220607, 0089_SD405_220607, 0089_SD409_220607, 0089_SD413_220607, 0089_SD415_220607, 0089_SD411_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD316_220607, 0089_SD308_220607, 0089_SD306_220607, 0089_SD314_220607, 0089_SD307_220607, 0089_SD315_220607, 0089_QC102_220607, 0089_SD407_220607, 0089_QC114_220607, 0089_SD405_220607, 0089_SD409_220607, 0089_SD413_220607, 0089_SD415_220607, 0089_SD411_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD316_220607, 0089_SD308_220607, 0089_SD306_220607, 0089_SD314_220607, 0089_SD307_220607, 0089_SD315_220607, 0089_QC102_220607, 0089_SD407_220607, 0089_QC114_220607, 0089_SD405_220607, 0089_SD409_220607, 0089_SD413_220607, 0089_SD415_220607, 0089_SD411_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD316_220607, 0089_SD308_220607, 0089_SD306_220607, 0089_SD314_220607, 0089_SD307_220607, 0089_SD315_220607, 0089_QC102_220607, 0089_SD407_220607, 0089_QC114_220607, 0089_SD405_220607, 0089_SD409_220607, 0089_SD413_220607, 0089_SD415_220607, 0089_SD411_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD316_220607, 0089_SD308_220607, 0089_SD306_220607, 0089_SD314_220607, 0089_SD307_220607, 0089_SD315_220607, 0089_QC102_220607, 0089_SD407_220607, 0089_QC114_220607, 0089_SD405_220607, 0089_SD409_220607, 0089_SD413_220607, 0089_SD415_220607, 0089_SD411_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	26-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 38643 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW314		07/06/2022 08:46 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW306		07/06/2022 08:47 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW315		07/06/2022 08:48 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW309		07/06/2022 08:49 AM	Water	ALS: 3 Non ALS: 0	No	Partial 3/8		
005	0089_PW307		07/06/2022 08:50 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc
006	0089_PW316		07/06/2022 08:51 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_SW310		07/06/2022 08:52 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_SW311		07/06/2022 08:52 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_PW308		07/06/2022 08:53 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 38643 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC103		07/06/2022 08:53 AM	Water	ALS: 3 Non ALS: 0	No	Partial 1/8		
011	0089_QC104		07/06/2022 08:54 AM	Water	ALS: 3 Non ALS: 0	No	Partial 1/8		
012	0089_SW408		07/06/2022 11:58 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
013	0089_PW407		07/06/2022 12:10 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_PW405		07/06/2022 12:28 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
015	0089_SW406		07/06/2022 12:29 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
016	0089_SW410		07/06/2022 01:31 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
017	0089_PW409		07/06/2022 01:34 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
018	0089_SW412		07/06/2022 01:56 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc

CHAIN OF CUSTODY

ALS COC#: 38643 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_PW413		07/06/2022 01:58 PM	Water	ALS: 3 Non ALS: 0	No	Partial 3/8		
020	0089_PW411		07/06/2022 01:59 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
021	0089_PW415		07/06/2022 02:00 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
022	0089_SW414		07/06/2022 02:01 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
023	0089_QC116		07/06/2022 02:01 PM	Water	ALS: 3 Non ALS: 0	No	Partial 1/8		
024	0089_SW416		07/06/2022 02:02 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: **38643** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW314	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW306	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW315	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW309	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW307	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW316	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_SW310	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_SW311	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW308	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_QC103	Surface Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **38643** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

011	0089_QC104	Surface Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
012	0089_SW408	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_PW407	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_PW405	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_SW406	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
016	0089_SW410	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
017	0089_PW409	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
018	0089_SW412	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
019	0089_PW413	Surface Waters WATER	Water	- NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
020	0089_PW411	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
021	0089_PW415	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) *COC#:* **38643** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

022	0089_SW414	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
023	0089_QC116	Surface Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
024	0089_SW416	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 38643 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW314	Clear Plastic Bottle - Natural	500 mL	00071121102363	Green	No	
001	0089_PW314	HDPE (no PTFE)	20 mL	00350621067568	Grey	No	
001	0089_PW314	HDPE (no PTFE)	20 mL	00350621067516	Grey	No	
002	0089_PW306	Clear Plastic Bottle - Natural	500 mL	00071121102294	Green	No	
002	0089_PW306	HDPE (no PTFE)	20 mL	00350621067438	Grey	No	
002	0089_PW306	HDPE (no PTFE)	20 mL	00350621067367	Grey	No	
003	0089_PW315	HDPE (no PTFE)	20 mL	00350621067462	Grey	No	
003	0089_PW315	HDPE (no PTFE)	20 mL	00350621067433	Grey	No	
003	0089_PW315	Clear Plastic Bottle - Natural	500 mL	0007112110237	Green	No	
004	0089_SW309	HDPE (no PTFE)	20 mL	00350621067465	Grey	No	
004	0089_SW309	HDPE (no PTFE)	20 mL	00350621067343	Grey	No	
004	0089_SW309	Clear Plastic Bottle - Natural	500 mL	00071121102333	Green	No	
005	0089_PW307	HDPE (no PTFE)	20 mL	00350621067485	Grey	No	
005	0089_PW307	HDPE (no PTFE)	20 mL	00350621067469	Grey	No	
005	0089_PW307	Clear Plastic Bottle - Natural	500 mL	00071121102316	Green	No	
005	0089_PW307	HDPE (no PTFE)	20 mL	00350621067525	Grey	No	
005	0089_PW307	HDPE (no PTFE)	20 mL	00350621067447	Grey	No	
006	0089_PW316	Clear Plastic Bottle - Natural	500 mL	00071121102279	Green	No	
006	0089_PW316	HDPE (no PTFE)	20 mL	00350621067584	Grey	No	
006	0089_PW316	HDPE (no PTFE)	20 mL	00350621067576	Grey	No	
007	0089_SW310	HDPE (no PTFE)	20 mL	00350621067358	Grey	No	
007	0089_SW310	HDPE (no PTFE)	20 mL	00350621067392	Grey	No	
007	0089_SW310	Clear Plastic Bottle - Natural	500 mL	00071121102347	Green	No	
008	0089_SW311	HDPE (no PTFE)	20 mL	00350621067468	Grey	No	
008	0089_SW311	HDPE (no PTFE)	20 mL	00350621067500	Grey	No	
008	0089_SW311	Clear Plastic Bottle - Natural	500 mL	00071121102259	Green	No	

CHAIN OF CUSTODY

ALS COC#: **38643** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW308	Clear Plastic Bottle - Natural	500 mL	00071121102322	Green	No	
009	0089_PW308	HDPE (no PTFE)	20 mL	00350621067535	Grey	No	
009	0089_PW308	HDPE (no PTFE)	20 mL	00350621067512	Grey	No	
010	0089_QC103	Clear Plastic Bottle - Natural	500 mL	00071121102255	Green	No	
010	0089_QC103	HDPE (no PTFE)	20 mL	00350621067548	Grey	No	
010	0089_QC103	HDPE (no PTFE)	20 mL	00350621067539	Grey	No	
011	0089_QC104	HDPE (no PTFE)	20 mL	00350621067736	Grey	No	
011	0089_QC104	HDPE (no PTFE)	20 mL	00350621067780	Grey	No	
011	0089_QC104	Clear Plastic Bottle - Natural	500 mL	00071121102306	Green	No	
012	0089_SW408	Clear Plastic Bottle - Natural	500 mL	00071121102422	Green	No	
012	0089_SW408	HDPE (no PTFE)	20 mL	00350621067782	Grey	No	
012	0089_SW408	HDPE (no PTFE)	20 mL	00350621067570	Grey	No	
013	0089_PW407	Clear Plastic Bottle - Natural	500 mL	00071121102336	Green	No	
013	0089_PW407	HDPE (no PTFE)	20 mL	00350621067893	Grey	No	
013	0089_PW407	HDPE (no PTFE)	20 mL	00350621067820	Grey	No	
014	0089_PW405	HDPE (no PTFE)	20 mL	00350621067937	Grey	No	
014	0089_PW405	HDPE (no PTFE)	20 mL	00350621067602	Grey	No	
014	0089_PW405	Clear Plastic Bottle - Natural	500 mL	00071121102382	Green	No	
015	0089_SW406	Clear Plastic Bottle - Natural	500 mL	00071121102303	Green	No	
015	0089_SW406	HDPE (no PTFE)	20 mL	00350621067518	Grey	No	
015	0089_SW406	HDPE (no PTFE)	20 mL	00350621067764	Grey	No	
016	0089_SW410	Clear Plastic Bottle - Natural	500 mL	00071121102391	Green	No	
016	0089_SW410	HDPE (no PTFE)	20 mL	00350621067837	Grey	No	
016	0089_SW410	HDPE (no PTFE)	20 mL	00350621067685	Grey	No	
017	0089_PW409	Clear Plastic Bottle - Natural	500 mL	00071121102365	Green	No	
017	0089_PW409	HDPE (no PTFE)	20 mL	00350621067829	Grey	No	
017	0089_PW409	HDPE (no PTFE)	20 mL	00350621033720	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: **38643** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

018	0089_SW412	HDPE (no PTFE)	20 mL	00352101073955	Grey	No	
018	0089_SW412	HDPE (no PTFE)	20 mL	00350621067788	Grey	No	
018	0089_SW412	Clear Plastic Bottle - Natural	500 mL	00071121102431	Green	No	
018	0089_SW412	HDPE (no PTFE)	20 mL	00350621067952	Grey	No	
018	0089_SW412	HDPE (no PTFE)	20 mL	00350621068007	Grey	No	
019	0089_PW413	Clear Plastic Bottle - Natural	500 mL	00071121102413	Green	No	
019	0089_PW413	HDPE (no PTFE)	20 mL	00352101073806	Grey	No	
019	0089_PW413	HDPE (no PTFE)	20 mL	00352101073795	Grey	No	
020	0089_PW411	Clear Plastic Bottle - Natural	500 mL	00071121102315	Green	No	
020	0089_PW411	HDPE (no PTFE)	20 mL	00350621067962	Grey	No	
020	0089_PW411	HDPE (no PTFE)	20 mL	00350621068019	Grey	No	
021	0089_PW415	HDPE (no PTFE)	20 mL	00352101073701	Grey	No	
021	0089_PW415	HDPE (no PTFE)	20 mL	00352101073473	Grey	No	
021	0089_PW415	Clear Plastic Bottle - Natural	500 mL	00071121102447	Green	No	
022	0089_SW414	HDPE (no PTFE)	20 mL	00352101073797	Grey	No	
022	0089_SW414	HDPE (no PTFE)	20 mL	00352101073659	Grey	No	
022	0089_SW414	Clear Plastic Bottle - Natural	500 mL	00071121102295	Green	No	
023	0089_QC116	HDPE (no PTFE)	20 mL	00350621067752	Grey	No	
023	0089_QC116	HDPE (no PTFE)	20 mL	00350621067803	Grey	No	
023	0089_QC116	Clear Plastic Bottle - Natural	500 mL	00071121102300	Green	No	
024	0089_SW416	Clear Plastic Bottle - Natural	500 mL	00071121102239	Green	No	
024	0089_SW416	HDPE (no PTFE)	20 mL	00350621067991	Grey	No	
024	0089_SW416	HDPE (no PTFE)	20 mL	00350621068009	Grey	No	

Total Bottle Count: ALS: 76, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2206887**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38643	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2022 12:45	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **15-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 24 / 24

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206887-001	07-Jun-2022 08:46	0089_PW314_220607	✓	✓	✓	✓
EP2206887-002	07-Jun-2022 08:47	0089_PW306_220607	✓	✓	✓	✓
EP2206887-003	07-Jun-2022 08:48	0089_PW315_220607	✓	✓	✓	✓
EP2206887-004	07-Jun-2022 08:49	0089_SW309_220607	✓	✓	✓	✓
EP2206887-005	07-Jun-2022 08:50	0089_PW307_220607	✓	✓	✓	✓
EP2206887-006	07-Jun-2022 08:51	0089_PW316_220607	✓	✓	✓	✓
EP2206887-007	07-Jun-2022 08:52	0089_SW310_220607	✓	✓	✓	✓
EP2206887-008	07-Jun-2022 08:52	0089_SW311_220607	✓	✓	✓	✓
EP2206887-009	07-Jun-2022 08:53	0089_PW308_220607	✓	✓	✓	✓
EP2206887-010	07-Jun-2022 08:53	0089_QC103_220607		✓		
EP2206887-011	07-Jun-2022 08:54	0089_QC104_220607		✓		
EP2206887-012	07-Jun-2022 11:58	0089_SW408_220607	✓	✓	✓	✓
EP2206887-013	07-Jun-2022 12:10	0089_PW407_220607	✓	✓	✓	✓
EP2206887-014	07-Jun-2022 12:28	0089_PW405_220607	✓	✓	✓	✓
EP2206887-015	07-Jun-2022 12:29	0089_SW406_220607	✓	✓	✓	✓
EP2206887-016	07-Jun-2022 13:31	0089_SW410_220607	✓	✓	✓	✓
EP2206887-017	07-Jun-2022 13:34	0089_PW409_220607	✓	✓	✓	✓
EP2206887-018	07-Jun-2022 13:56	0089_SW412_220607	✓	✓	✓	✓
EP2206887-019	07-Jun-2022 13:58	0089_PW413_220607	✓	✓	✓	✓
EP2206887-020	07-Jun-2022 13:59	0089_PW411_220607	✓	✓	✓	✓
EP2206887-021	07-Jun-2022 14:00	0089_PW415_220607	✓	✓	✓	✓
EP2206887-022	07-Jun-2022 14:01	0089_SW414_220607	✓	✓	✓	✓
EP2206887-023	07-Jun-2022 14:01	0089_QC116_220607		✓		
EP2206887-024	07-Jun-2022 14:02	0089_SW416_220607	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206887**	Page	: 1 of 18
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022 12:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38643	Issue Date	: 20-Jun-2022 14:27
Sampler	: [redacted]		
Site	: Stirling SW/PW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 24		
No. of samples analysed	: 24		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Positive result for analyte Perfluorooctane sulfonic acid (PFOS) and on sample EP2206887_009 has been confirmed by re-extraction and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW314_220607	0089_PW306_220607	0089_PW315_220607	0089_SW309_220607	0089_PW307_220607
			Sampling date / time	07-Jun-2022 08:46	07-Jun-2022 08:47	07-Jun-2022 08:48	07-Jun-2022 08:49	07-Jun-2022 08:50
Compound	CAS Number	LOR	Unit	EP2206887-001	EP2206887-002	EP2206887-003	EP2206887-004	EP2206887-005
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	158	629	200	123	137
Total Alkalinity as CaCO3	----	1	mg/L	158	629	200	123	137
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2890	2810	2520	2480	2540
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	19000	19300	17500	16900	17100
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	452	541	488	445	442
Magnesium	7439-95-4	1	mg/L	1380	1410	1500	1440	1420
Sodium	7440-23-5	1	mg/L	10200	10200	11000	10600	10500
Potassium	7440-09-7	1	mg/L	576	607	582	560	555
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	599	616	550	531	538
ø Total Cations	----	0.01	meq/L	594	602	641	616	610
ø Ionic Balance	----	0.01	%	0.40	1.09	7.64	7.44	6.26
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW314_220607	0089_PW306_220607	0089_PW315_220607	0089_SW309_220607	0089_PW307_220607
				Sampling date / time	07-Jun-2022 08:46	07-Jun-2022 08:47	07-Jun-2022 08:48	07-Jun-2022 08:49	07-Jun-2022 08:50
Compound	CAS Number	LOR	Unit		EP2206887-001	EP2206887-002	EP2206887-003	EP2206887-004	EP2206887-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW314_220607	0089_PW306_220607	0089_PW315_220607	0089_SW309_220607	0089_PW307_220607
				Sampling date / time	07-Jun-2022 08:46	07-Jun-2022 08:47	07-Jun-2022 08:48	07-Jun-2022 08:49	07-Jun-2022 08:50
					EP2206887-001	EP2206887-002	EP2206887-003	EP2206887-004	EP2206887-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**105**	**99.2**	**102**	**104**
13C8-PFOA	----	0.02	%		**104**	**98.6**	**98.1**	**99.3**	**97.7**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW316_220607	0089_SW310_220607	0089_SW311_220607	0089_PW308_220607	0089_QC103_220607
			Sampling date / time	07-Jun-2022 08:51	07-Jun-2022 08:52	07-Jun-2022 08:52	07-Jun-2022 08:53	07-Jun-2022 08:53
Compound	CAS Number	LOR	Unit	EP2206887-006	EP2206887-007	EP2206887-008	EP2206887-009	EP2206887-010
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	139	122	116	132	----
Total Alkalinity as CaCO3	----	1	mg/L	139	122	116	132	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2490	2460	2520	2610	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	17000	17100	17600	16400	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	458	444	439	439	----
Magnesium	7439-95-4	1	mg/L	1470	1440	1420	1430	----
Sodium	7440-23-5	1	mg/L	10800	10600	10400	10400	----
Potassium	7440-09-7	1	mg/L	571	559	555	557	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	534	536	551	520	----
ø Total Cations	----	0.01	meq/L	628	616	605	606	----
ø Ionic Balance	----	0.01	%	8.09	6.94	4.68	7.69	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	0.03	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW316_220607	0089_SW310_220607	0089_SW311_220607	0089_PW308_220607	0089_QC103_220607
				Sampling date / time	07-Jun-2022 08:51	07-Jun-2022 08:52	07-Jun-2022 08:52	07-Jun-2022 08:53	07-Jun-2022 08:53
Compound	CAS Number	LOR	Unit		EP2206887-006	EP2206887-007	EP2206887-008	EP2206887-009	EP2206887-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW316_220607	0089_SW310_220607	0089_SW311_220607	0089_PW308_220607	0089_QC103_220607
				Sampling date / time	07-Jun-2022 08:51	07-Jun-2022 08:52	07-Jun-2022 08:52	07-Jun-2022 08:53	07-Jun-2022 08:53
Compound	CAS Number	LOR	Unit		EP2206887-006	EP2206887-007	EP2206887-008	EP2206887-009	EP2206887-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.03**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.03**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.03**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**99.3**	**94.9**	**100**	**99.1**
13C8-PFOA	----	0.02	%		**99.2**	**101**	**97.9**	**100**	**99.5**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC104_220607	0089_SW408_220607	0089_PW407_220607	0089_PW405_220607	0089_SW406_220607
				Sampling date / time	07-Jun-2022 08:54	07-Jun-2022 11:58	07-Jun-2022 12:10	07-Jun-2022 12:28	07-Jun-2022 12:29
Compound	CAS Number	LOR	Unit		EP2206887-011	EP2206887-012	EP2206887-013	EP2206887-014	EP2206887-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	124	195	130	122
Total Alkalinity as CaCO3	----	1	mg/L		----	124	195	130	122
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	2780	2400	2640	2900
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	17300	15000	19200	19200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	458	416	505	445
Magnesium	7439-95-4	1	mg/L		----	1460	1320	1640	1380
Sodium	7440-23-5	1	mg/L		----	10800	9700	12100	10200
Potassium	7440-09-7	1	mg/L		----	575	517	644	575
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	548	477	599	604
ø Total Cations	----	0.01	meq/L		----	627	564	703	594
ø Ionic Balance	----	0.01	%		----	6.73	8.40	7.97	0.86
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC104_220607	0089_SW408_220607	0089_PW407_220607	0089_PW405_220607	0089_SW406_220607
				Sampling date / time	07-Jun-2022 08:54	07-Jun-2022 11:58	07-Jun-2022 12:10	07-Jun-2022 12:28	07-Jun-2022 12:29
Compound	CAS Number	LOR	Unit		EP2206887-011	EP2206887-012	EP2206887-013	EP2206887-014	EP2206887-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC104_220607	0089_SW408_220607	0089_PW407_220607	0089_PW405_220607	0089_SW406_220607
				Sampling date / time	07-Jun-2022 08:54	07-Jun-2022 11:58	07-Jun-2022 12:10	07-Jun-2022 12:28	07-Jun-2022 12:29
Compound	CAS Number	LOR	Unit		EP2206887-011	EP2206887-012	EP2206887-013	EP2206887-014	EP2206887-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.7**	**98.3**	**99.0**	**103**	**97.8**
13C8-PFOA	----	0.02	%		**98.0**	**101**	**96.0**	**98.4**	**95.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_220607	0089_PW409_220607	0089_SW412_220607	0089_PW413_220607	0089_PW411_220607
				Sampling date / time	07-Jun-2022 13:31	07-Jun-2022 13:34	07-Jun-2022 13:56	07-Jun-2022 13:58	07-Jun-2022 13:59
Compound	CAS Number	LOR	Unit		EP2206887-016	EP2206887-017	EP2206887-018	EP2206887-019	EP2206887-020
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		120	155	122	128	136
Total Alkalinity as CaCO3	----	1	mg/L		120	155	122	128	136
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2580	2730	2530	2480	2430
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17900	17800	17200	17400	17100
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		460	496	443	441	464
Magnesium	7439-95-4	1	mg/L		1500	1590	1440	1420	1500
Sodium	7440-23-5	1	mg/L		11000	11800	10600	10400	11000
Potassium	7440-09-7	1	mg/L		585	631	560	554	577
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		561	562	540	545	536
ø Total Cations	----	0.01	meq/L		640	685	616	605	640
ø Ionic Balance	----	0.01	%		6.56	9.86	6.55	5.25	8.86
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_220607	0089_PW409_220607	0089_SW412_220607	0089_PW413_220607	0089_PW411_220607
				Sampling date / time	07-Jun-2022 13:31	07-Jun-2022 13:34	07-Jun-2022 13:56	07-Jun-2022 13:58	07-Jun-2022 13:59
Compound	CAS Number	LOR	Unit		EP2206887-016	EP2206887-017	EP2206887-018	EP2206887-019	EP2206887-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_220607	0089_PW409_220607	0089_SW412_220607	0089_PW413_220607	0089_PW411_220607
				Sampling date / time	07-Jun-2022 13:31	07-Jun-2022 13:34	07-Jun-2022 13:56	07-Jun-2022 13:58	07-Jun-2022 13:59
Compound	CAS Number	LOR	Unit		EP2206887-016	EP2206887-017	EP2206887-018	EP2206887-019	EP2206887-020
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**98.1**	**99.7**	**104**	**100**
13C8-PFOA	----	0.02	%		**99.7**	**97.7**	**98.2**	**96.8**	**100**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW415_220607	0089_SW414_220607	0089_QC116_220607	0089_SW416_220607	----
			Sampling date / time	07-Jun-2022 14:00	07-Jun-2022 14:01	07-Jun-2022 14:01	07-Jun-2022 14:02	----
Compound	CAS Number	LOR	Unit	EP2206887-021	EP2206887-022	EP2206887-023	EP2206887-024	--------
				Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**142**	**120**	----	**123**	----
Total Alkalinity as CaCO3	----	1	mg/L	**142**	**120**	----	**123**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2540**	**2700**	----	**2600**	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**18300**	**17300**	----	**17800**	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**447**	**434**	----	**453**	----
Magnesium	7439-95-4	1	mg/L	**1450**	**1410**	----	**1480**	----
Sodium	7440-23-5	1	mg/L	**10600**	**10300**	----	**10700**	----
Potassium	7440-09-7	1	mg/L	**561**	**546**	----	**573**	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**572**	**547**	----	**559**	----
ø Total Cations	----	0.01	meq/L	**617**	**600**	----	**624**	----
ø Ionic Balance	----	0.01	%	**3.80**	**4.63**	----	**5.56**	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW415_220607	0089_SW414_220607	0089_QC116_220607	0089_SW416_220607	----
				Sampling date / time	07-Jun-2022 14:00	07-Jun-2022 14:01	07-Jun-2022 14:01	07-Jun-2022 14:02	----
Compound	CAS Number	LOR	Unit		EP2206887-021	EP2206887-022	EP2206887-023	EP2206887-024	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW415_220607	0089_SW414_220607	0089_QC116_220607	0089_SW416_220607	----
			Sampling date / time	07-Jun-2022 14:00	07-Jun-2022 14:01	07-Jun-2022 14:01	07-Jun-2022 14:02	----
Compound	CAS Number	LOR	Unit	EP2206887-021	EP2206887-022	EP2206887-023	EP2206887-024	--------
				Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**102**	**102**	**98.2**	**97.7**	----
13C8-PFOA	----	0.02	%	**98.9**	**99.6**	**102**	**97.7**	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206887**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38643	Issue Date	: 20-Jun-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 24		
No. of samples analysed	: 24		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4397333)									
EP2206887-002	0089_PW306_220607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	629	633	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	629	633	0.6	0% - 20%
EP2206887-013	0089_PW407_220607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	195	192	1.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	195	192	1.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4397334)									
EP2206943-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	126	125	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	126	125	0.8	0% - 20%
EP2206943-011	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	126	124	1.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	126	124	1.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4393514)									
EP2206887-001	0089_PW314_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2890	2910	0.8	0% - 20%
EP2206887-013	0089_PW407_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2400	2570	6.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4393524)									
EP2206884-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2720	2770	1.7	0% - 20%
EP2206888-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	302	299	0.9	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 4393513)									
EP2206887-001	0089_PW314_220607	ED045G: Chloride	16887-00-6	1	mg/L	19000	19200	0.7	0% - 20%
EP2206887-013	0089_PW407_220607	ED045G: Chloride	16887-00-6	1	mg/L	15000	15400	2.6	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4393523)									
EP2206884-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17200	17600	2.3	0% - 20%
EP2206888-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1260	1260	0.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4393553)									
EP2206887-001	0089_PW314_220607	ED093F: Calcium	7440-70-2	1	mg/L	452	450	0.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1380	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10200	10200	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	576	574	0.3	0% - 20%
EP2206887-013	0089_PW407_220607	ED093F: Calcium	7440-70-2	1	mg/L	416	462	10.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1320	1490	11.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	9700	11000	12.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	517	588	12.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4393554)									
EP2206887-024	0089_SW416_220607	ED093F: Calcium	7440-70-2	1	mg/L	453	456	0.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1480	1480	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10700	10900	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	573	574	0.3	0% - 20%
EP2207133-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	80	80	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	363	364	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2850	2880	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	147	146	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4397764)									
EP2206887-005	0089_PW307_220607	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4397764)									
EP2206887-005	0089_PW307_220607	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4397764) - continued									
EP2206887-005	0089_PW307_220607	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4397764)									
EP2206887-005	0089_PW307_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4397764)									
EP2206887-005	0089_PW307_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4397764)									
EP2206887-005	0089_PW307_220607	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4397333)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	81.2	126
				<1	200 mg/L	97.4	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4397334)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	106	81.2	126
				<1	200 mg/L	98.0	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393514)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100.0	87.7	113
				<1	500 mg/L	97.3	87.7	113
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393524)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	87.7	113
				<1	500 mg/L	103	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4393513)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.6	87.9	114
				<1	1000 mg/L	95.6	87.9	114
ED045G: Chloride by Discrete Analyser (QCLot: 4393523)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	87.9	114
				<1	1000 mg/L	92.6	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4393553)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	113	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.1	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.0	89.7	108
ED093F: Dissolved Major Cations (QCLot: 4393554)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	113	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.7	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	87.3	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 4393554) - continued								
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.3	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4397764)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	103	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	109	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	120	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	103	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	100	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4398039)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	121	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	122	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	130	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	118	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	109	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4397764)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	114	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	119	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	119	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	124	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	95.7	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4398039)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	116	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	120	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	113	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	119	65.0	144

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4398039) - continued								
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	101	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4397764)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	123	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	116	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	108	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	120	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4398039)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	125	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	105	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	118	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4397764)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	115	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	100	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	133	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4398039)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	114	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	112	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	128	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393514)							
EP2206887-001	0089_PW314_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393524)							
EP2206884-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4393513)							
EP2206887-001	0089_PW314_220607	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4393523)							
EP2206884-006	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4397764)							
EP2206887-018	0089_SW412_220607	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	104	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	117	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	121	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	118	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	119	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	131	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4397764)							
EP2206887-018	0089_SW412_220607	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	95.8	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	116	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	114	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	123	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	116	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	119	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	120	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	114	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	119	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	123	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	98.9	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4397764)							
EP2206887-018	0089_SW412_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	125	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	120	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	104	62.6	147

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4397764) - continued							
EP2206887-018	0089_SW412_220607	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	113	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	115	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	115	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4397764)							
EP2206887-018	0089_SW412_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	122	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	124	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206887**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Site	: Stirling SW/PW - AG	Issue Date	: 20-Jun-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 24
Order number	: pfas-omp/Stirling	No. of samples analysed	: 24

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206887--001	0089_PW314_220607	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206884--006	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206887--001	0089_PW314_220607	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206884--006	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	24	4.17	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	24	4.17	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW314_220607, 0089_PW306_220607, 0089_PW315_220607, 0089_SW309_220607, 0089_PW307_220607, 0089_PW316_220607, 0089_SW310_220607, 0089_SW311_220607, 0089_PW308_220607, 0089_SW408_220607, 0089_PW407_220607, 0089_PW405_220607, 0089_SW406_220607, 0089_SW410_220607, 0089_PW409_220607, 0089_SW412_220607, 0089_PW413_220607, 0089_PW411_220607, 0089_PW415_220607, 0089_SW414_220607, 0089_SW416_220607	**07-Jun-2022**	**----**	----	----	**14-Jun-2022**	21-Jun-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW416_220607	**07-Jun-2022**	**----**	----	----	**14-Jun-2022**	05-Jul-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_PW314_220607, 0089_PW306_220607, 0089_PW315_220607, 0089_SW309_220607, 0089_PW307_220607, 0089_PW316_220607, 0089_SW310_220607, 0089_SW311_220607, 0089_PW308_220607, 0089_SW408_220607, 0089_PW407_220607, 0089_PW405_220607, 0089_SW406_220607, 0089_SW410_220607, 0089_PW409_220607, 0089_SW412_220607, 0089_PW413_220607, 0089_PW411_220607, 0089_PW415_220607, 0089_SW414_220607	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW416_220607	**07-Jun-2022**	**----**	----	----	**14-Jun-2022**	05-Jul-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_PW314_220607, 0089_PW306_220607, 0089_PW315_220607, 0089_SW309_220607, 0089_PW307_220607, 0089_PW316_220607, 0089_SW310_220607, 0089_SW311_220607, 0089_PW308_220607, 0089_SW408_220607, 0089_PW407_220607, 0089_PW405_220607, 0089_SW406_220607, 0089_SW410_220607, 0089_PW409_220607, 0089_SW412_220607, 0089_PW413_220607, 0089_PW411_220607, 0089_PW415_220607, 0089_SW414_220607	**07-Jun-2022**	**----**	----	----	**17-Jun-2022**	05-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW314_220607, 0089_PW306_220607, 0089_PW315_220607, 0089_SW309_220607, 0089_PW307_220607, 0089_PW316_220607, 0089_SW310_220607, 0089_SW311_220607, 0089_PW308_220607, 0089_SW408_220607, 0089_PW407_220607, 0089_PW405_220607, 0089_SW406_220607, 0089_SW410_220607, 0089_PW409_220607, 0089_SW412_220607, 0089_PW413_220607, 0089_PW411_220607, 0089_PW415_220607, 0089_SW414_220607, 0089_SW416_220607	**07-Jun-2022**	**----**	----	----	**13-Jun-2022**	14-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW314_220607, 0089_PW306_220607, 0089_PW315_220607, 0089_SW309_220607, 0089_PW307_220607, 0089_PW316_220607, 0089_SW310_220607, 0089_SW311_220607, 0089_PW308_220607, 0089_QC103_220607, 0089_QC104_220607, 0089_SW408_220607, 0089_PW407_220607, 0089_PW405_220607, 0089_SW406_220607, 0089_SW410_220607, 0089_PW409_220607, 0089_SW412_220607, 0089_PW413_220607, 0089_PW411_220607, 0089_PW415_220607, 0089_SW414_220607, 0089_QC116_220607, 0089_SW416_220607	**07-Jun-2022**	**14-Jun-2022**	04-Dec-2022	✓	**15-Jun-2022**	04-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW314_220607, 0089_PW306_220607, 0089_PW315_220607, 0089_SW309_220607, 0089_PW307_220607, 0089_PW316_220607, 0089_SW310_220607, 0089_SW311_220607, 0089_PW308_220607, 0089_QC103_220607, 0089_QC104_220607, 0089_SW408_220607, 0089_PW407_220607, 0089_PW405_220607, 0089_SW406_220607, 0089_SW410_220607, 0089_PW409_220607, 0089_SW412_220607, 0089_PW413_220607, 0089_PW411_220607, 0089_PW415_220607, 0089_SW414_220607, 0089_QC116_220607, 0089_SW416_220607	**07-Jun-2022**	**14-Jun-2022**	04-Dec-2022	✓	**15-Jun-2022**	04-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW314_220607, 0089_PW306_220607, 0089_PW315_220607, 0089_SW309_220607, 0089_PW307_220607, 0089_PW316_220607, 0089_SW310_220607, 0089_SW311_220607, 0089_PW308_220607, 0089_QC103_220607, 0089_QC104_220607, 0089_SW408_220607, 0089_PW407_220607, 0089_PW405_220607, 0089_SW406_220607, 0089_SW410_220607, 0089_PW409_220607, 0089_SW412_220607, 0089_PW413_220607, 0089_PW411_220607, 0089_PW415_220607, 0089_SW414_220607, 0089_QC116_220607, 0089_SW416_220607	**07-Jun-2022**	**14-Jun-2022**	04-Dec-2022	✓	**15-Jun-2022**	04-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW314_220607, 0089_PW306_220607, 0089_PW315_220607, 0089_SW309_220607, 0089_PW307_220607, 0089_PW316_220607, 0089_SW310_220607, 0089_SW311_220607, 0089_PW308_220607, 0089_QC103_220607, 0089_QC104_220607, 0089_SW408_220607, 0089_PW407_220607, 0089_PW405_220607, 0089_SW406_220607, 0089_SW410_220607, 0089_PW409_220607, 0089_SW412_220607, 0089_PW413_220607, 0089_PW411_220607, 0089_PW415_220607, 0089_SW414_220607, 0089_QC116_220607, 0089_SW416_220607	**07-Jun-2022**	**14-Jun-2022**	04-Dec-2022	✓	**15-Jun-2022**	04-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW314_220607, 0089_PW306_220607, 0089_PW315_220607, 0089_SW309_220607, 0089_PW307_220607, 0089_PW316_220607, 0089_SW310_220607, 0089_SW311_220607, 0089_PW308_220607, 0089_QC103_220607, 0089_QC104_220607, 0089_SW408_220607, 0089_PW407_220607, 0089_PW405_220607, 0089_SW406_220607, 0089_SW410_220607, 0089_PW409_220607, 0089_SW412_220607, 0089_PW413_220607, 0089_PW411_220607, 0089_PW415_220607, 0089_SW414_220607, 0089_QC116_220607, 0089_SW416_220607	**07-Jun-2022**	**14-Jun-2022**	04-Dec-2022	✓	**15-Jun-2022**	04-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	24	**4.17**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	24	**4.17**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: 38634 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW214		07/06/2022 08:01 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0089_MW216		07/06/2022 08:13 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_MW215		07/06/2022 08:26 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW225		07/06/2022 11:13 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_QC112		07/06/2022 11:13 AM	Water	ALS: 3 Non ALS: 0	No		X		
006	0089_MW227		07/06/2022 11:40 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_MW228		07/06/2022 12:54 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab qaqc
008	0089_MW227		07/06/2022 01:23 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
009	0089_QC301		07/06/2022 04:19 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 38634 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC302		07/06/2022 04:20 PM	Water	ALS: 2 Non ALS: 0	No		X		
011	0089_QC303		07/06/2022 04:21 PM	Water	ALS: 2 Non ALS: 0	No		X		
012	0089_QC401		07/06/2022 04:22 PM	Water	ALS: 2 Non ALS: 0	No		X		
013	0089_QC402		07/06/2022 04:23 PM	Water	ALS: 2 Non ALS: 0	No		X		
014	0089_QC403		07/06/2022 04:24 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 38634 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW214	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW216	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW215	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW225	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW227	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW228	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW227	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 38634 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW214	Clear Plastic Bottle - Natural	500 mL	00071121102244	Green	No	
001	0089_MW214	HDPE (no PTFE)	20 mL	00350621067755	Grey	No	
001	0089_MW214	HDPE (no PTFE)	20 mL	00350621067783	Grey	No	
002	0089_MW216	Clear Plastic Bottle - Natural	500 mL	00071121102292	Green	No	
002	0089_MW216	HDPE (no PTFE)	20 mL	00350621067476	Grey	No	
002	0089_MW216	HDPE (no PTFE)	20 mL	00350621067480	Grey	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350621067448	Grey	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350621067450	Grey	No	
003	0089_MW215	Clear Plastic Bottle - Natural	500 mL	00071121102251	Green	No	
004	0089_MW225	Clear Plastic Bottle - Natural	500 mL	00071121102243	Green	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350621067558	Grey	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350621067796	Grey	No	
005	0089_QC112	Clear Plastic Bottle - Natural	500 mL	00071121102332	Green	No	
005	0089_QC112	HDPE (no PTFE)	20 mL	00350621067992	Grey	No	
005	0089_QC112	HDPE (no PTFE)	20 mL	00350621067790	Grey	No	
006	0089_MW227	Clear Plastic Bottle - Natural	500 mL	00071121102438	Green	No	
006	0089_MW227	HDPE (no PTFE)	20 mL	00350621067989	Grey	No	
006	0089_MW227	HDPE (no PTFE)	20 mL	00350621067836	Grey	No	
007	0089_MW228	Clear Plastic Bottle - Natural	500 mL	00071121102238	Green	No	
007	0089_MW228	HDPE (no PTFE)	20 mL	00352101058026	Grey	No	
007	0089_MW228	HDPE (no PTFE)	20 mL	00352101058287	Grey	No	
007	0089_MW228	HDPE (no PTFE)	20 mL	00352101058076	Grey	No	
007	0089_MW228	HDPE (no PTFE)	20 mL	00352101058349	Grey	No	
008	0089_MW227	HDPE (no PTFE)	20 mL	00350621068012	Grey	No	
008	0089_MW227	HDPE (no PTFE)	20 mL	00350621067886	Grey	No	
008	0089_MW227	Clear Plastic Bottle - Natural	500 mL	00071121102372	Green	No	

CHAIN OF CUSTODY

COC#: 38634 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_QC301	HDPE (no PTFE)	20 mL	00352101058231	Grey	No	
009	0089_QC301	HDPE (no PTFE)	20 mL	00352101058195	Grey	No	
010	0089_QC302	HDPE (no PTFE)	20 mL	00352101058326	Grey	No	
010	0089_QC302	HDPE (no PTFE)	20 mL	00352101058309	Grey	No	
011	0089_QC303	HDPE (no PTFE)	20 mL	00352101058347	Grey	No	
011	0089_QC303	HDPE (no PTFE)	20 mL	00350621041348	Grey	No	
012	0089_QC401	HDPE (no PTFE)	20 mL	00350621041456	Grey	No	
012	0089_QC401	HDPE (no PTFE)	20 mL	00350621041389	Grey	No	
013	0089_QC402	HDPE (no PTFE)	20 mL	00350621041428	Grey	No	
013	0089_QC402	HDPE (no PTFE)	20 mL	00352101058073	Grey	No	
014	0089_QC403	HDPE (no PTFE)	20 mL	00352101058292	Grey	No	
014	0089_QC403	HDPE (no PTFE)	20 mL	00350621041395	Grey	No	

Total Bottle Count: ALS: 38, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206888**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38634	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Jun-2022 12:45	Issue Date	: 09-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 6	Temperature	: 10.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 14 / 14

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206888-001	07-Jun-2022 08:01	0089_MW214_220607	✓	✓	✓	✓
EP2206888-002	07-Jun-2022 08:13	0089_MW216_220607	✓	✓	✓	✓
EP2206888-003	07-Jun-2022 08:26	0089_MW215_220607	✓	✓	✓	✓
EP2206888-004	07-Jun-2022 11:13	0089_MW225_220607	✓	✓	✓	✓
EP2206888-005	07-Jun-2022 11:13	0089_QC112_220607		✓		
EP2206888-006	07-Jun-2022 11:40	0089_MW227_220607	✓	✓	✓	✓
EP2206888-007	07-Jun-2022 12:54	0089_MW228_220607	✓	✓	✓	✓
EP2206888-008	07-Jun-2022 13:23	0089_MW226_220607	✓	✓	✓	✓
EP2206888-009	07-Jun-2022 16:19	0089_QC301_220607		✓		
EP2206888-010	07-Jun-2022 16:20	0089_QC302_220607		✓		
EP2206888-011	07-Jun-2022 16:21	0089_QC303_220607		✓		
EP2206888-012	07-Jun-2022 16:22	0089_QC401_220607		✓		
EP2206888-013	07-Jun-2022 16:23	0089_QC402_220607		✓		
EP2206888-014	07-Jun-2022 16:24	0089_QC403_220607		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]
- Chain of Custody (CoC) (COC) — Email [redacted]
- EDI Format - ESDAT (ESDAT) — Email [redacted]
- EDI Format - XTab (XTAB) — Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206888**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022 12:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38634	Issue Date	: 20-Jun-2022 15:25
Sampler	: [redacted]		
Site	: Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- ED041G (Sulfate - Turbidimetric): sample EP2206888-004 was re-filtered and re-analyzed from parent sample to confirm results.
- ED045G (Chloride): sample EP2206888-004 was re-filtered and re-analyzed from parent sample to confirm results.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW214_220607	0089_MW216_220607	0089_MW215_220607	0089_MW225_220607	0089_QC112_220607
				Sampling date / time	07-Jun-2022 08:01	07-Jun-2022 08:13	07-Jun-2022 08:26	07-Jun-2022 11:13	07-Jun-2022 11:13
Compound	CAS Number	LOR	Unit		EP2206888-001	EP2206888-002	EP2206888-003	EP2206888-004	EP2206888-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		526	343	316	319	----
Total Alkalinity as CaCO3	----	1	mg/L		526	343	316	319	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		22	96	139	55	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		971	407	676	503	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		231	148	173	140	----
Magnesium	7439-95-4	1	mg/L		78	41	48	42	----
Sodium	7440-23-5	1	mg/L		447	168	273	218	----
Potassium	7440-09-7	1	mg/L		15	7	14	9	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		38.4	20.3	28.3	21.7	----
ø Total Cations	----	0.01	meq/L		37.8	18.2	24.8	20.2	----
ø Ionic Balance	----	0.01	%		0.77	5.41	6.52	3.71	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.39	0.14	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.45	0.17	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	3.29	0.80	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.16	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	1.16	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	0.9	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	3.60	0.12	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	2.23	0.42	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	0.30	0.05	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW214_220607	0089_MW216_220607	0089_MW215_220607	0089_MW225_220607	0089_QC112_220607
				Sampling date / time	07-Jun-2022 08:01	07-Jun-2022 08:13	07-Jun-2022 08:26	07-Jun-2022 11:13	07-Jun-2022 11:13
Compound	CAS Number	LOR	Unit		EP2206888-001	EP2206888-002	EP2206888-003	EP2206888-004	EP2206888-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.30**	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**2.95**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW214_220607	0089_MW216_220607	0089_MW215_220607	0089_MW225_220607	0089_QC112_220607
				Sampling date / time	07-Jun-2022 08:01	07-Jun-2022 08:13	07-Jun-2022 08:26	07-Jun-2022 11:13	07-Jun-2022 11:13
Compound	CAS Number	LOR	Unit		EP2206888-001	EP2206888-002	EP2206888-003	EP2206888-004	EP2206888-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**15.7**	**1.70**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**4.45**	**0.80**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**15.1**	**1.53**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.9**	**99.5**	**104**	**94.7**	**99.0**
13C8-PFOA	----	0.02	%		**95.7**	**97.9**	**97.1**	**94.1**	**96.6**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW227_220607	0089_MW228_220607	0089_MW226_220607	----	----
				Sampling date / time	07-Jun-2022 11:40	07-Jun-2022 12:54	07-Jun-2022 13:23	----	----
Compound	CAS Number	LOR	Unit		EP2206888-006	EP2206888-007	EP2206888-008	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		503	515	644	----	----
Total Alkalinity as CaCO3	----	1	mg/L		503	515	644	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		302	1120	2260	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1260	7410	13700	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		157	209	477	----	----
Magnesium	7439-95-4	1	mg/L		106	490	1290	----	----
Sodium	7440-23-5	1	mg/L		644	3680	8880	----	----
Potassium	7440-09-7	1	mg/L		45	172	508	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		51.9	243	446	----	----
ø Total Cations	----	0.01	meq/L		45.7	215	529	----	----
ø Ionic Balance	----	0.01	%		6.31	5.99	8.49	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.11	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.08	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.09	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	1.6	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	7.48	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	7.21	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	1.56	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW227_220607	0089_MW228_220607	0089_MW226_220607	----	----
				Sampling date / time	07-Jun-2022 11:40	07-Jun-2022 12:54	07-Jun-2022 13:23	----	----
Compound	CAS Number	LOR	Unit		EP2206888-006	EP2206888-007	EP2206888-008	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.02**	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**0.19**	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW227_220607	0089_MW228_220607	0089_MW226_220607	----	----
				Sampling date / time	07-Jun-2022 11:40	07-Jun-2022 12:54	07-Jun-2022 13:23	----	----
Compound	CAS Number	LOR	Unit		EP2206888-006	EP2206888-007	EP2206888-008	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**18.3**	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.09**	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**18.3**	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**101**	**107**	----	----
13C8-PFOA	----	0.02	%		**95.9**	**94.4**	**97.5**	----	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC301_220607	0089_QC302_220607	0089_QC303_220607	0089_QC401_220607	0089_QC402_220607
				Sampling date / time	07-Jun-2022 16:19	07-Jun-2022 16:20	07-Jun-2022 16:21	07-Jun-2022 16:22	07-Jun-2022 16:23
					EP2206888-009	EP2206888-010	EP2206888-011	EP2206888-012	EP2206888-013
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220607	0089_QC302_220607	0089_QC303_220607	0089_QC401_220607	0089_QC402_220607
				Sampling date / time	07-Jun-2022 16:19	07-Jun-2022 16:20	07-Jun-2022 16:21	07-Jun-2022 16:22	07-Jun-2022 16:23
Compound	CAS Number	LOR	Unit		EP2206888-009	EP2206888-010	EP2206888-011	EP2206888-012	EP2206888-013
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**97.9**	**94.7**	**92.4**	**97.8**
13C8-PFOA	----	0.02	%		**95.5**	**96.6**	**96.0**	**97.0**	**97.5**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	**0089_QC403_220607**	----	----	----	----
				Sampling date / time	07-Jun-2022 16:24	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2206888-014**	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_220607	----	----	----	----
				Sampling date / time	07-Jun-2022 16:24	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206888-014	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.9**	----	----	----	----
13C8-PFOA	----	0.02	%		**100**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206888**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: 38634	Issue Date	: 20-Jun-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4402872)									
EP2206884-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	124	0.0	0% - 20%
EP2206888-007	0089_MW228_220607	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	515	514	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	515	514	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4393524)									
EP2206884-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2720	2770	1.7	0% - 20%
EP2206888-006	0089_MW227_220607	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	302	299	0.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4393523)									
EP2206884-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17200	17600	2.3	0% - 20%
EP2206888-006	0089_MW227_220607	ED045G: Chloride	16887-00-6	1	mg/L	1260	1260	0.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4392204)									
EP2206884-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	479	457	4.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1380	6.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	10200	5.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	602	564	6.5	0% - 20%
EP2206888-001	0089_MW214_220607	ED093F: Calcium	7440-70-2	1	mg/L	231	226	2.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	78	76	1.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	447	443	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4402389)									
EP2206888-007	0089_MW228_220607	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.09	0.10	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.11	0.14	17.3	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4402389)									
EP2206888-007	0089_MW228_220607	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	7.48	7.68	2.8	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	7.21	7.94	9.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.56	1.76	12.4	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.6	1.6	0.0	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4402389)									
EP2206888-007	0089_MW228_220607	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4402389)									
EP2206888-007	0089_MW228_220607	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.19	0.23	21.7	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4402389) - continued									
EP2206888-007	0089_MW228_220607	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4402389)									
EP2206888-007	0089_MW228_220607	EP231X: Sum of PFAS	----	0.01	µg/L	18.3	19.6	6.4	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4402872)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	81.2	126
				<1	200 mg/L	100	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393524)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	87.7	113
				<1	500 mg/L	103	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4393523)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	87.9	114
				<1	1000 mg/L	92.6	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4392204)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	109	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.0	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	112	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402389)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	125	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	124	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	126	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	127	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	113	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	122	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402389)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	112	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	127	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	125	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	125	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	124	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	124	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	117	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	125	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402389) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	118	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402389)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	123	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	113	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	114	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	118	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	116	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	126	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402389)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	112	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	125	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	126	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	120	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4393524)							
EP2206884-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4393523)							
EP2206884-006	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206888**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 08-Jun-2022
Site	: Stirling GW - AG	Issue Date	: 20-Jun-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 14
Order number	: pfas-omp/Stirling	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206884--006	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206884--006	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW214_220607, 0089_MW216_220607, 0089_MW215_220607, 0089_MW225_220607, 0089_MW227_220607, 0089_MW228_220607, 0089_MW226_220607	**07-Jun-2022**	**----**	----	----	**16-Jun-2022**	21-Jun-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW214_220607, 0089_MW216_220607, 0089_MW215_220607, 0089_MW225_220607, 0089_MW227_220607, 0089_MW228_220607, 0089_MW226_220607	**07-Jun-2022**	**----**	----	----	**14-Jun-2022**	05-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW214_220607, 0089_MW216_220607, 0089_MW215_220607, 0089_MW225_220607, 0089_MW227_220607, 0089_MW228_220607, 0089_MW226_220607	**07-Jun-2022**	**----**	----	----	**14-Jun-2022**	05-Jul-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW214_220607, 0089_MW216_220607, 0089_MW215_220607, 0089_MW225_220607, 0089_MW227_220607, 0089_MW228_220607, 0089_MW226_220607	**07-Jun-2022**	**----**	----	----	**10-Jun-2022**	14-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW214_220607, 0089_MW216_220607, 0089_MW215_220607, 0089_MW225_220607, 0089_QC112_220607, 0089_MW227_220607, 0089_MW228_220607, 0089_MW226_220607, 0089_QC301_220607, 0089_QC302_220607, 0089_QC303_220607, 0089_QC401_220607, 0089_QC402_220607, 0089_QC403_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	04-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW214_220607, 0089_MW216_220607, 0089_MW215_220607, 0089_MW225_220607, 0089_QC112_220607, 0089_MW227_220607, 0089_MW228_220607, 0089_MW226_220607, 0089_QC301_220607, 0089_QC302_220607, 0089_QC303_220607, 0089_QC401_220607, 0089_QC402_220607, 0089_QC403_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	04-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW214_220607, 0089_MW216_220607, 0089_MW215_220607, 0089_MW225_220607, 0089_QC112_220607, 0089_MW227_220607, 0089_MW228_220607, 0089_MW226_220607, 0089_QC301_220607, 0089_QC302_220607, 0089_QC303_220607, 0089_QC401_220607, 0089_QC402_220607, 0089_QC403_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	04-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW214_220607, 0089_MW216_220607, 0089_MW215_220607, 0089_MW225_220607, 0089_QC112_220607, 0089_MW227_220607, 0089_MW228_220607, 0089_MW226_220607, 0089_QC301_220607, 0089_QC302_220607, 0089_QC303_220607, 0089_QC401_220607, 0089_QC402_220607, 0089_QC403_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	04-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW214_220607, 0089_MW216_220607, 0089_MW215_220607, 0089_MW225_220607, 0089_QC112_220607, 0089_MW227_220607, 0089_MW228_220607, 0089_MW226_220607, 0089_QC301_220607, 0089_QC302_220607, 0089_QC303_220607, 0089_QC401_220607, 0089_QC402_220607, 0089_QC403_220607	**07-Jun-2022**	**16-Jun-2022**	04-Dec-2022	✓	**17-Jun-2022**	04-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

(ALS) COC#: **38695** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD358		08/06/2022 12:20 PM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD329		08/06/2022 12:21 PM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD330		08/06/2022 12:21 PM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_SD331		08/06/2022 12:53 PM	Soil	ALS: 1 Non ALS: 0	No	X		
005	0089_SD356		08/06/2022 12:53 PM	Soil	ALS: 1 Non ALS: 0	No	X		
006	0089_SD357		08/06/2022 01:03 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 38695 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD358	HDPE Soil Jar	200 mL	00620322041426	Grey	No	
002	0089_SD329	HDPE Soil Jar	200 mL	00620322041508	Grey	No	
003	0089_SD330	HDPE Soil Jar	200 mL	00620322041475	Grey	No	
004	0089_SD331	HDPE Soil Jar	200 mL	00620322041521	Grey	No	
005	0089_SD356	HDPE Soil Jar	200 mL	00620322041452	Grey	No	
006	0089_SD357	HDPE Soil Jar	200 mL	00620322041432	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206968**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38695	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Jun-2022 12:00	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 17.9 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2206968-001	08-Jun-2022 12:20	0089_SD358_220608	✓	✓
EP2206968-002	08-Jun-2022 12:21	0089_SD329_220608	✓	✓
EP2206968-003	08-Jun-2022 12:21	0089_SD330_220608	✓	✓
EP2206968-004	08-Jun-2022 12:53	0089_SD331_220608	✓	✓
EP2206968-005	08-Jun-2022 12:53	0089_SD356_220608	✓	✓
EP2206968-006	08-Jun-2022 13:03	0089_SD357_220608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206968**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Jun-2022
C-O-C number	: 38695	Issue Date	: 21-Jun-2022 09:10
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD358_220608	0089_SD329_220608	0089_SD330_220608	0089_SD331_220608	0089_SD356_220608
				Sampling date / time	08-Jun-2022 12:20	08-Jun-2022 12:21	08-Jun-2022 12:21	08-Jun-2022 12:53	08-Jun-2022 12:53
					EP2206968-001	EP2206968-002	EP2206968-003	EP2206968-004	EP2206968-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**10.9**	**20.9**	**20.4**	**17.0**	**18.7**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD358_220608	0089_SD329_220608	0089_SD330_220608	0089_SD331_220608	0089_SD356_220608
				Sampling date / time	08-Jun-2022 12:20	08-Jun-2022 12:21	08-Jun-2022 12:21	08-Jun-2022 12:53	08-Jun-2022 12:53
Compound	CAS Number	LOR	Unit		EP2206968-001	EP2206968-002	EP2206968-003	EP2206968-004	EP2206968-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**96.5**	**93.5**	**100**	**95.0**	**97.5**
13C8-PFOA	----	0.0002	%		**108**	**106**	**104**	**106**	**115**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD357_220608	----	----	----	----
				Sampling date / time	08-Jun-2022 13:03	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206968-006	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**20.8**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD357_220608	----	----	----	----
				Sampling date / time	08-Jun-2022 13:03	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206968-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.0**	----	----	----	----
13C8-PFOA	----	0.0002	%		**111**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206968**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Jun-2022
C-O-C number	: 38695	Issue Date	: 21-Jun-2022
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4407146)									
EP2206886-006	Anonymous	EA055: Moisture Content	----	0.1	%	26.6	26.7	0.0	0% - 20%
EP2206968-003	0089_SD330_220608	EA055: Moisture Content	----	0.1	%	20.4	19.3	5.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4404257)									
EP2206968-001	0089_SD358_220608	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2220380-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0105	0.0086	19.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4404257)									
EP2206968-001	0089_SD358_220608	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4404257) - continued									
EP2206968-001	0089_SD358_220608	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2220380-009	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0004	0.0003	35.9	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0003	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0012	0.0009	22.7	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0005	0.0004	26.8	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4404257)									
EP2206968-001	0089_SD358_220608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2220380-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4404257)									
EP2206968-001	0089_SD358_220608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2220380-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4404257)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	123	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4404257)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	111	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	121	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	118	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4404257)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	126	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	122	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	117	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	120	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4404257)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	105	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	125	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	120	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4404257) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	120	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4404257)							
EP2206968-001	0089_SD358_220608	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	113	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	123	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	113	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	109	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	102	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	120	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4404257)							
EP2206968-001	0089_SD358_220608	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	110	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	122	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	122	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	118	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	121	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	116	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	120	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	120	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	126	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	115	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4404257)							
EP2206968-001	0089_SD358_220608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	123	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	109	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	120	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	115	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	115	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	117	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4404257) - continued							
EP2206968-001	0089_SD358_220608	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	113	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4404257)							
EP2206968-001	0089_SD358_220608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	114	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	123	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	116	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	121	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206968**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling SD - MB	Issue Date	: 21-Jun-2022
Sampler	: [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD358_220608,	0089_SD329_220608,	**08-Jun-2022**	**----**	----	----	**18-Jun-2022**	22-Jun-2022	✓
0089_SD330_220608,	0089_SD331_220608,							
0089_SD356_220608,	0089_SD357_220608							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD358_220608,	0089_SD329_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓
0089_SD330_220608,	0089_SD331_220608,							
0089_SD356_220608,	0089_SD357_220608							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD358_220608,	0089_SD329_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓
0089_SD330_220608,	0089_SD331_220608,							
0089_SD356_220608,	0089_SD357_220608							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD358_220608,	0089_SD329_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓
0089_SD330_220608,	0089_SD331_220608,							
0089_SD356_220608,	0089_SD357_220608							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD358_220608,	0089_SD329_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓
0089_SD330_220608,	0089_SD331_220608,							
0089_SD356_220608,	0089_SD357_220608							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD358_220608,	0089_SD329_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓
0089_SD330_220608,	0089_SD331_220608,							
0089_SD356_220608,	0089_SD357_220608							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 38696 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

/ ES2022MWHAUS0002

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW139		08/06/2022 08:59 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
002	0089_MW141		08/06/2022 09:14 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_MW173		08/06/2022 12:18 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW142		08/06/2022 12:58 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW149		08/06/2022 01:00 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW289		08/06/2022 01:36 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_MW233		08/06/2022 01:55 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_MW516		08/06/2022 02:50 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
009	0089_MW249		08/06/2022 03:06 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

ALS COC#: **38696** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW242		08/06/2022 03:19 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
011	0089_QC301		08/06/2022 03:43 PM	Water	ALS: 2 Non ALS: 0	No		X		
012	0089_QC302		08/06/2022 03:44 PM	Water	ALS: 2 Non ALS: 0	No		X		
013	0089_QC401		08/06/2022 03:45 PM	Water	ALS: 2 Non ALS: 0	No		X		
014	0089_QC402		08/06/2022 03:45 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: **38696** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW139	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW141	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW173	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW142	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW149	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW289	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW233	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW516	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW249	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 38696 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_MW242	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 38696 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW139	Clear Plastic Bottle - Natural	500 mL	00071121102408	Green	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00352101073668	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350621067910	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350621067757	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00352101073879	Grey	No	
002	0089_MW141	Clear Plastic Bottle - Natural	500 mL	00071121102249	Green	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350621067855	Grey	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350621067743	Grey	No	
003	0089_MW173	HDPE (no PTFE)	20 mL	00350621067658	Grey	No	
003	0089_MW173	HDPE (no PTFE)	20 mL	00350621067739	Grey	No	
003	0089_MW173	Clear Plastic Bottle - Natural	500 mL	00071121102350	Green	No	
004	0089_MW142	Clear Plastic Bottle - Natural	500 mL	00071121102324	Green	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350621067416	Grey	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350621033730	Grey	No	
005	0089_MW149	Clear Plastic Bottle - Natural	500 mL	00071121102233	Green	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00350621067593	Grey	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00350621067464	Grey	No	
006	0089_MW289	HDPE (no PTFE)	20 mL	00350621067709	Grey	No	
006	0089_MW289	HDPE (no PTFE)	20 mL	00350621067969	Grey	No	
006	0089_MW289	Clear Plastic Bottle - Natural	500 mL	00071121102256	Green	No	
007	0089_MW233	HDPE (no PTFE)	20 mL	00350621067405	Grey	No	
007	0089_MW233	HDPE (no PTFE)	20 mL	00350621067828	Grey	No	
007	0089_MW233	Clear Plastic Bottle - Natural	500 mL	00071121102377	Green	No	
008	0089_MW516	HDPE (no PTFE)	20 mL	00350621067608	Grey	No	
008	0089_MW516	HDPE (no PTFE)	20 mL	00350621067657	Grey	No	
008	0089_MW516	Clear Plastic Bottle - Natural	500 mL	00071121102291	Green	No	

CHAIN OF CUSTODY

ALS COC#: 38696 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW249	Clear Plastic Bottle - Natural	500 mL	00071121102287	Green	No	
009	0089_MW249	HDPE (no PTFE)	20 mL	00350621067547	Grey	No	
009	0089_MW249	HDPE (no PTFE)	20 mL	00350621067401	Grey	No	
010	0089_MW242	HDPE (no PTFE)	20 mL	00350621067916	Grey	No	
010	0089_MW242	HDPE (no PTFE)	20 mL	00350621067554	Grey	No	
010	0089_MW242	Clear Plastic Bottle - Natural	500 mL	00071121102252	Green	No	
011	0089_QC301	HDPE (no PTFE)	20 mL	00350621041424	Grey	No	
011	0089_QC301	HDPE (no PTFE)	20 mL	00352101058007	Grey	No	
012	0089_QC302	HDPE (no PTFE)	20 mL	00350621041465	Grey	No	
012	0089_QC302	HDPE (no PTFE)	20 mL	00350621041272	Grey	No	
013	0089_QC401	HDPE (no PTFE)	20 mL	00352101058274	Grey	No	
013	0089_QC401	HDPE (no PTFE)	20 mL	00352101058335	Grey	No	
014	0089_QC402	HDPE (no PTFE)	20 mL	00352101057947	Grey	No	
014	0089_QC402	HDPE (no PTFE)	20 mL	00352101058001	Grey	No	

Total Bottle Count: ALS: 40, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206969**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38696	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Jun-2022 12:00	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 17.9 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 14 / 14

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206969-001	08-Jun-2022 08:59	0089_MW139_220608	✓	✓	✓	✓
EP2206969-002	08-Jun-2022 09:14	0089_MW141_220608	✓	✓	✓	✓
EP2206969-003	08-Jun-2022 12:18	0089_MW173_220608	✓	✓	✓	✓
EP2206969-004	08-Jun-2022 12:58	0089_MW142_220608	✓	✓	✓	✓
EP2206969-005	08-Jun-2022 13:00	0089_MW149_220608	✓	✓	✓	✓
EP2206969-006	08-Jun-2022 13:36	0089_MW289_220608	✓	✓	✓	✓
EP2206969-007	08-Jun-2022 13:55	0089_MW233_220608	✓	✓	✓	✓
EP2206969-008	08-Jun-2022 14:50	0089_MW516_220608	✓	✓	✓	✓
EP2206969-009	08-Jun-2022 15:06	0089_MW249_220608	✓	✓	✓	✓
EP2206969-010	08-Jun-2022 15:19	0089_MW242_220608	✓	✓	✓	✓
EP2206969-011	08-Jun-2022 15:43	0089_QC301_220608		✓		
EP2206969-012	08-Jun-2022 15:44	0089_QC302_220608		✓		
EP2206969-013	08-Jun-2022 15:45	0089_QC401_220608		✓		
EP2206969-014	08-Jun-2022 15:45	0089_QC402_220608		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]
- Chain of Custody (CoC) (COC) — Email — [redacted]
- EDI Format - ESDAT (ESDAT) — Email — [redacted]
- EDI Format - XTab (XTAB) — Email — [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206969**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38696	Issue Date	: 21-Jun-2022 11:10
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Positive result on sample #010 has been confirmed by re-extraction and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_220608	0089_MW141_220608	0089_MW173_220608	0089_MW142_220608	0089_MW149_220608
				Sampling date / time	08-Jun-2022 08:59	08-Jun-2022 09:14	08-Jun-2022 12:18	08-Jun-2022 12:58	08-Jun-2022 13:00
Compound	CAS Number	LOR	Unit		EP2206969-001	EP2206969-002	EP2206969-003	EP2206969-004	EP2206969-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		312	383	464	297	200
Total Alkalinity as CaCO3	----	1	mg/L		312	383	464	297	200
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		448	1430	126	1810	2500
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		4020	10100	803	12800	16900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		208	410	129	395	456
Magnesium	7439-95-4	1	mg/L		316	863	105	990	1370
Sodium	7440-23-5	1	mg/L		1850	5840	429	6920	9870
Potassium	7440-09-7	1	mg/L		92	318	34	378	553
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		129	322	34.5	405	533
ø Total Cations	----	0.01	meq/L		119	354	34.6	412	579
ø Ionic Balance	----	0.01	%		3.93	4.63	0.09	0.88	4.16
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.49	0.20	0.03	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	1.07	0.18	0.07	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	13.3	4.53	1.55	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	1.62	0.80	0.05	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	40.3	8.62	2.32	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	0.2	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	0.67	0.19	0.08	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	5.54	0.50	0.67	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	0.28	0.09	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_220608	0089_MW141_220608	0089_MW173_220608	0089_MW142_220608	0089_MW149_220608
				Sampling date / time	08-Jun-2022 08:59	08-Jun-2022 09:14	08-Jun-2022 12:18	08-Jun-2022 12:58	08-Jun-2022 13:00
Compound	CAS Number	LOR	Unit		EP2206969-001	EP2206969-002	EP2206969-003	EP2206969-004	EP2206969-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**1.34**	**0.54**	**0.11**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.02**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	**0.06**	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_220608	0089_MW141_220608	0089_MW173_220608	0089_MW142_220608	0089_MW149_220608
				Sampling date / time	08-Jun-2022 08:59	08-Jun-2022 09:14	08-Jun-2022 12:18	08-Jun-2022 12:58	08-Jun-2022 13:00
Compound	CAS Number	LOR	Unit		EP2206969-001	EP2206969-002	EP2206969-003	EP2206969-004	EP2206969-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**64.8**	**15.7**	**4.88**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**53.6**	**13.2**	**3.87**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**62.1**	**14.7**	**4.76**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**99.2**	**98.8**	**102**	**96.7**
13C8-PFOA	----	0.02	%		**100**	**99.0**	**98.3**	**101**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_220608	0089_MW233_220608	0089_MW516_220608	0089_MW249_220608	0089_MW242_220608
				Sampling date / time	08-Jun-2022 13:36	08-Jun-2022 13:55	08-Jun-2022 14:50	08-Jun-2022 15:06	08-Jun-2022 15:19
Compound	CAS Number	LOR	Unit		EP2206969-006	EP2206969-007	EP2206969-008	EP2206969-009	EP2206969-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**396**	**106**	**483**	**444**	**199**
Total Alkalinity as CaCO3	----	1	mg/L		**396**	**106**	**483**	**444**	**199**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**70**	**2**	**71**	**56**	**26**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**99**	**12**	**143**	**151**	**18**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**135**	**32**	**130**	**108**	**70**
Magnesium	7439-95-4	1	mg/L		**28**	**4**	**52**	**48**	**12**
Sodium	7440-23-5	1	mg/L		**83**	**12**	**104**	**99**	**14**
Potassium	7440-09-7	1	mg/L		**5**	**2**	**16**	**11**	**2**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**12.2**	**2.50**	**15.2**	**14.3**	**5.02**
ø Total Cations	----	0.01	meq/L		**12.8**	**2.50**	**15.7**	**13.9**	**5.14**
ø Ionic Balance	----	0.01	%		**2.47**	**0.02**	**1.74**	**1.31**	**1.14**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.11**	<0.02	**0.06**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.13**	<0.02	**0.05**	**0.02**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.74**	**0.02**	**0.90**	**0.21**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.02**	<0.02	**0.12**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.34**	**0.10**	**10.4**	**0.03**	**0.02**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.09**	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.25**	<0.02	**0.11**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.05**	<0.02	**0.02**	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_220608	0089_MW233_220608	0089_MW516_220608	0089_MW249_220608	0089_MW242_220608
				Sampling date / time	08-Jun-2022 13:36	08-Jun-2022 13:55	08-Jun-2022 14:50	08-Jun-2022 15:06	08-Jun-2022 15:19
Compound	CAS Number	LOR	Unit		EP2206969-006	EP2206969-007	EP2206969-008	EP2206969-009	EP2206969-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.05**	<0.01	**0.08**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_220608	0089_MW233_220608	0089_MW516_220608	0089_MW249_220608	0089_MW242_220608
				Sampling date / time	08-Jun-2022 13:36	08-Jun-2022 13:55	08-Jun-2022 14:50	08-Jun-2022 15:06	08-Jun-2022 15:19
Compound	CAS Number	LOR	Unit		EP2206969-006	EP2206969-007	EP2206969-008	EP2206969-009	EP2206969-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.78**	**0.12**	**11.7**	**0.26**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.08**	**0.12**	**11.3**	**0.24**	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.63**	**0.12**	**11.6**	**0.24**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.4**	**98.7**	**101**	**99.2**	**104**
13C8-PFOA	----	0.02	%		**99.7**	**95.5**	**98.1**	**97.1**	**100**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220608	0089_QC302_220608	0089_QC401_220608	0089_QC402_220608	----
				Sampling date / time	08-Jun-2022 15:43	08-Jun-2022 15:44	08-Jun-2022 15:45	08-Jun-2022 15:45	----
Compound	CAS Number	LOR	Unit		EP2206969-011	EP2206969-012	EP2206969-013	EP2206969-014	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220608	0089_QC302_220608	0089_QC401_220608	0089_QC402_220608	----
				Sampling date / time	08-Jun-2022 15:43	08-Jun-2022 15:44	08-Jun-2022 15:45	08-Jun-2022 15:45	----
Compound	CAS Number	LOR	Unit		EP2206969-011	EP2206969-012	EP2206969-013	EP2206969-014	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**106**	**101**	**94.9**	----
13C8-PFOA	----	0.02	%		**101**	**99.4**	**97.9**	**98.0**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231S: PFAS Surrogate

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206969**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38696	Issue Date	: 21-Jun-2022
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4402872)									
EP2206884-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	124	0.0	0% - 20%
EP2206888-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	515	514	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	515	514	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4402873)									
EP2206995-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
EP2207111-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4396042)									
EP2207142-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	11900	12200	2.3	0% - 20%
EP2207142-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3060	3020	1.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4396041)									
EP2207142-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	110000	124000	12.0	0% - 20%
EP2207142-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	124000	124000	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4395469)									
EP2206969-007	0089_MW233_220608	ED093F: Calcium	7440-70-2	1	mg/L	32	32	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	4	4	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP2206950-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	10	10	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	5	5	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	30	30	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4402594)									
EP2206969-001	0089_MW139_220608	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2206970-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.09	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4402594)									
EP2206969-001	0089_MW139_220608	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2206970-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4402594) - continued									
EP2206970-010	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4402594)									
EP2206969-001	0089_MW139_220608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2206970-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4402594)									
EP2206969-001	0089_MW139_220608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4402594) - continued									
EP2206970-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4402594)									
EP2206969-001	0089_MW139_220608	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2206970-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.10	0.11	9.5	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4402872)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	81.2	126
				<1	200 mg/L	100	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4402873)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	100	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396042)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.6	87.7	113
				<1	500 mg/L	89.2	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4396041)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.9	87.9	114
				<1	1000 mg/L	106	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4395469)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.7	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.0	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402594)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	112	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403305)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	110	71.0	127

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403305) - continued								
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	106	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	111	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	113	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402594)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	118	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	122	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	114	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403305)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	112	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	120	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402594)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	106	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402594) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403305)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	117	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	110	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.5	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	117	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	95.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402594)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	121	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	125	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	117	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	142	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403305)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	119	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	91.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	108	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	127	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396042)							
EP2207142-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4396041)							
EP2207142-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402594)							
EP2206970-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	99.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	107	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	98.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	111	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402594)							
EP2206970-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	114	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	109	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	114	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	119	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	115	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	110	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	119	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	123	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	97.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402594)							
EP2206970-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	104	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	112	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.0	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	96.1	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	112	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	109	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402594)							
EP2206970-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	106	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	128	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	99.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	128	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206969**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling GW - MB	Issue Date	: 21-Jun-2022
Sampler	: [redacted]	No. of samples received	: 14
Order number	: pfas-omp/Stirling	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2207142--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2207142--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	26	7.69	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	26	3.85	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)		*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW139_220608,	0089_MW141_220608,	**08-Jun-2022**	**----**	----	----	**16-Jun-2022**	22-Jun-2022	✓
0089_MW173_220608,	0089_MW142_220608,							
0089_MW149_220608,	0089_MW289_220608,							
0089_MW233_220608,	0089_MW516_220608,							
0089_MW249_220608,	0089_MW242_220608							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW139_220608, 0089_MW141_220608, 0089_MW173_220608, 0089_MW142_220608, 0089_MW149_220608, 0089_MW289_220608, 0089_MW233_220608, 0089_MW516_220608, 0089_MW249_220608, 0089_MW242_220608	**08-Jun-2022**	**----**	----	----	**15-Jun-2022**	06-Jul-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW139_220608, 0089_MW141_220608, 0089_MW173_220608, 0089_MW142_220608, 0089_MW149_220608, 0089_MW289_220608, 0089_MW233_220608, 0089_MW516_220608, 0089_MW249_220608, 0089_MW242_220608	**08-Jun-2022**	**----**	----	----	**15-Jun-2022**	06-Jul-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW139_220608, 0089_MW141_220608, 0089_MW173_220608, 0089_MW142_220608, 0089_MW149_220608, 0089_MW289_220608, 0089_MW233_220608, 0089_MW516_220608, 0089_MW249_220608, 0089_MW242_220608	**08-Jun-2022**	**----**	----	----	**13-Jun-2022**	15-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_220608, 0089_MW141_220608, 0089_MW173_220608, 0089_MW142_220608, 0089_MW149_220608, 0089_MW289_220608, 0089_MW233_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X)							
0089_MW516_220608, 0089_MW249_220608, 0089_MW242_220608, 0089_QC301_220608, 0089_QC302_220608, 0089_QC401_220608, 0089_QC402_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0089_MW139_220608, 0089_MW141_220608, 0089_MW173_220608, 0089_MW142_220608, 0089_MW149_220608, 0089_MW289_220608, 0089_MW233_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X) 0089_MW516_220608, 0089_MW249_220608, 0089_MW242_220608, 0089_QC301_220608, 0089_QC302_220608, 0089_QC401_220608, 0089_QC402_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_MW139_220608, 0089_MW141_220608, 0089_MW173_220608, 0089_MW142_220608, 0089_MW149_220608, 0089_MW289_220608, 0089_MW233_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X) 0089_MW516_220608, 0089_MW249_220608, 0089_MW242_220608, 0089_QC301_220608, 0089_QC302_220608, 0089_QC401_220608, 0089_QC402_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW139_220608, 0089_MW141_220608, 0089_MW173_220608, 0089_MW142_220608, 0089_MW149_220608, 0089_MW289_220608, 0089_MW233_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X) 0089_MW516_220608, 0089_MW249_220608, 0089_MW242_220608, 0089_QC301_220608, 0089_QC302_220608, 0089_QC401_220608, 0089_QC402_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW139_220608, 0089_MW141_220608, 0089_MW173_220608, 0089_MW142_220608, 0089_MW149_220608, 0089_MW289_220608, 0089_MW233_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X)							
0089_MW516_220608, 0089_MW249_220608, 0089_MW242_220608, 0089_QC301_220608, 0089_QC302_220608, 0089_QC401_220608, 0089_QC402_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	26	**3.85**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 38697 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B

/ ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW330		08/06/2022 12:48 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
002	0089_QC117		08/06/2022 12:49 PM	Water	ALS: 2 Non ALS: 0	No	X			
003	0089_SW154		08/06/2022 12:51 PM	Water	ALS: 5 Non ALS: 0	No		Partial 4/8		extra PFAS bottles for lab QC
004	0089_SW152		08/06/2022 12:54 PM	Water	ALS: 3 Non ALS: 0	No		Partial 3/8		
005	0089_PW329		08/06/2022 12:55 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
006	0089_SW156		08/06/2022 01:01 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
007	0089_SW150		08/06/2022 01:03 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
008	0089_PW331		08/06/2022 01:09 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
009	0089_QC118		08/06/2022 01:09 PM	Water	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: **38697** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW356		08/06/2022 01:10 PM	Water	ALS: 5 Non ALS: 0	No		Partial 4/8		extra PFAS bottles for lab QC
011	0089_PW358		08/06/2022 01:14 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
012	0089_PW357		08/06/2022 01:15 PM	Water	ALS: 3 Non ALS: 0	No		Partial 3/8		

CHAIN OF CUSTODY

ALS COC#: 38697 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW330	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW154	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW152	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW329	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW156	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_SW150	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_PW331	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0089_PW356	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_PW358	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_PW357	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F

CHAIN OF CUSTODY

ALS COC#: 38697 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B

/ ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A

Random Sample Temperature on Receipt: °C

Other comments:

CHAIN OF CUSTODY

ALS COC#: 38697 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW330	Clear Plastic Bottle - Natural	500 mL	00071121102403	Green	No	
001	0089_PW330	HDPE (no PTFE)	20 mL	00350621067575	Grey	No	
001	0089_PW330	HDPE (no PTFE)	20 mL	00350621067574	Grey	No	
002	0089_QC117	HDPE (no PTFE)	20 mL	00352101073503	Grey	No	
002	0089_QC117	HDPE (no PTFE)	20 mL	00352101073971	Grey	No	
003	0089_SW154	Clear Plastic Bottle - Natural	500 mL	00071121102421	Green	No	
003	0089_SW154	HDPE (no PTFE)	20 mL	00352101073474	Grey	No	
003	0089_SW154	HDPE (no PTFE)	20 mL	00352101073528	Grey	No	
003	0089_SW154	HDPE (no PTFE)	20 mL	00350621067460	Grey	No	
004	0089_SW152	HDPE (no PTFE)	20 mL	00350621067475	Grey	No	
004	0089_SW152	HDPE (no PTFE)	20 mL	00350621067360	Grey	No	
004	0089_SW152	Clear Plastic Bottle - Natural	500 mL	00071121102370	Green	No	
005	0089_PW329	Clear Plastic Bottle - Natural	500 mL	00071121102374	Green	No	
005	0089_PW329	HDPE (no PTFE)	20 mL	00350621067472	Grey	No	
006	0089_SW156	HDPE (no PTFE)	20 mL	00350621067734	Grey	No	
006	0089_SW156	HDPE (no PTFE)	20 mL	00350621067449	Grey	No	
006	0089_SW156	Clear Plastic Bottle - Natural	500 mL	00071121102423	Green	No	
007	0089_SW150	Clear Plastic Bottle - Natural	500 mL	00071121102235	Green	No	
007	0089_SW150	HDPE (no PTFE)	20 mL	00350621067712	Grey	No	
007	0089_SW150	HDPE (no PTFE)	20 mL	00350621067489	Grey	No	
008	0089_PW331	Clear Plastic Bottle - Natural	500 mL	00071121102341	Green	No	
008	0089_PW331	HDPE (no PTFE)	20 mL	00350621067490	Grey	No	
008	0089_PW331	HDPE (no PTFE)	20 mL	00350621067571	Grey	No	
009	0089_QC118	HDPE (no PTFE)	20 mL	00352101073786	Grey	No	

CHAIN OF CUSTODY

COC#: 38697 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_QC118	HDPE (no PTFE)	20 mL	00352101073834	Grey	No	
010	0089_PW356	Clear Plastic Bottle - Natural	500 mL	00071121102419	Green	No	
010	0089_PW356	HDPE (no PTFE)	20 mL	00352101073577	Grey	No	
010	0089_PW356	HDPE (no PTFE)	20 mL	00352101074025	Grey	No	
010	0089_PW356	HDPE (no PTFE)	20 mL	00350621067564	Grey	No	
011	0089_PW358	HDPE (no PTFE)	20 mL	00350621067566	Grey	No	
011	0089_PW358	Clear Plastic Bottle - Natural	500 mL	00071121102296	Green	No	
011	0089_PW358	HDPE (no PTFE)	20 mL	00350621067482	Grey	No	
012	0089_PW357	HDPE (no PTFE)	20 mL	00350621067990	Grey	No	
012	0089_PW357	Clear Plastic Bottle - Natural	500 mL	00071121102234	Green	No	
012	0089_PW357	HDPE (no PTFE)	20 mL	00350621067501	Grey	No	
		HDPE (no PTFE)	20 mL	00350621067346	Grey	No	

Total Bottle Count: ALS: 38, Non ALS: 0

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206970**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38697	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Jun-2022 12:00	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 17.9 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206970-001	08-Jun-2022 12:48	0089_PW330_220608	✓	✓	✓	✓
EP2206970-002	08-Jun-2022 12:49	0089_QC117_220608		✓		
EP2206970-003	08-Jun-2022 12:51	0089_SW154_220608	✓	✓	✓	✓
EP2206970-004	08-Jun-2022 12:54	0089_SW152_220608	✓	✓		✓
EP2206970-005	08-Jun-2022 12:55	0089_PW329_220608	✓	✓	✓	✓
EP2206970-006	08-Jun-2022 13:01	0089_SW156_220608	✓	✓	✓	✓
EP2206970-007	08-Jun-2022 13:03	0089_SW150_220608	✓	✓	✓	✓
EP2206970-008	08-Jun-2022 13:09	0089_PW331_220608	✓	✓	✓	✓
EP2206970-009	08-Jun-2022 13:09	0089_QC118_220608		✓		
EP2206970-010	08-Jun-2022 13:10	0089_PW356_220608	✓	✓	✓	✓
EP2206970-011	08-Jun-2022 13:14	0089_PW358_220608	✓	✓	✓	✓
EP2206970-012	08-Jun-2022 13:15	0089_PW357_220608	✓		✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206970**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38697	Issue Date	: 21-Jun-2022 09:14
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW330_220608	0089_QC117_220608	0089_SW154_220608	0089_SW152_220608	0089_PW329_220608
				Sampling date / time	08-Jun-2022 12:48	08-Jun-2022 12:49	08-Jun-2022 12:51	08-Jun-2022 12:54	08-Jun-2022 12:55
					EP2206970-001	EP2206970-002	EP2206970-003	EP2206970-004	EP2206970-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**418**	----	**125**	**125**	**245**
Total Alkalinity as CaCO3	----	1	mg/L		**418**	----	**125**	**125**	**245**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2520**	----	**2620**	**2350**	**2370**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18600**	----	**16800**	**17700**	**18200**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**586**	----	**460**	**472**	**509**
Magnesium	7439-95-4	1	mg/L		**1580**	----	**1500**	**1540**	**1540**
Sodium	7440-23-5	1	mg/L		**11400**	----	**10900**	**11200**	**11100**
Potassium	7440-09-7	1	mg/L		**631**	----	**602**	**616**	**624**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**586**	----	**531**	**551**	**568**
ø Total Cations	----	0.01	meq/L		**671**	----	**636**	**653**	**651**
ø Ionic Balance	----	0.01	%		**6.82**	----	**9.00**	**8.51**	**6.83**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW330_220608	0089_QC117_220608	0089_SW154_220608	0089_SW152_220608	0089_PW329_220608
				Sampling date / time	08-Jun-2022 12:48	08-Jun-2022 12:49	08-Jun-2022 12:51	08-Jun-2022 12:54	08-Jun-2022 12:55
Compound	CAS Number	LOR	Unit		EP2206970-001	EP2206970-002	EP2206970-003	EP2206970-004	EP2206970-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW330_220608	0089_QC117_220608	0089_SW154_220608	0089_SW152_220608	0089_PW329_220608
				Sampling date / time	08-Jun-2022 12:48	08-Jun-2022 12:49	08-Jun-2022 12:51	08-Jun-2022 12:54	08-Jun-2022 12:55
Compound	CAS Number	LOR	Unit		EP2206970-001	EP2206970-002	EP2206970-003	EP2206970-004	EP2206970-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.6**	**93.8**	**91.6**	**93.5**	**99.7**
13C8-PFOA	----	0.02	%		**97.1**	**97.9**	**95.1**	**98.3**	**93.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW156_220608	0089_SW150_220608	0089_PW331_220608	0089_QC118_220608	0089_PW356_220608
				Sampling date / time	08-Jun-2022 13:01	08-Jun-2022 13:03	08-Jun-2022 13:09	08-Jun-2022 13:09	08-Jun-2022 13:10
Compound	CAS Number	LOR	Unit		EP2206970-006	EP2206970-007	EP2206970-008	EP2206970-009	EP2206970-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		123	130	247	----	235
Total Alkalinity as CaCO3	----	1	mg/L		123	130	247	----	235
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2360	2770	3020	----	2600
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18000	17500	17600	----	18200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		450	459	529	----	528
Magnesium	7439-95-4	1	mg/L		1460	1510	1610	----	1610
Sodium	7440-23-5	1	mg/L		10700	11000	11700	----	11800
Potassium	7440-09-7	1	mg/L		586	603	654	----	656
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		559	554	564	----	572
ø Total Cations	----	0.01	meq/L		623	641	684	----	689
ø Ionic Balance	----	0.01	%		5.38	7.29	9.63	----	9.25
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	0.08
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW156_220608	0089_SW150_220608	0089_PW331_220608	0089_QC118_220608	0089_PW356_220608
				Sampling date / time	08-Jun-2022 13:01	08-Jun-2022 13:03	08-Jun-2022 13:09	08-Jun-2022 13:09	08-Jun-2022 13:10
Compound	CAS Number	LOR	Unit		EP2206970-006	EP2206970-007	EP2206970-008	EP2206970-009	EP2206970-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW156_220608	0089_SW150_220608	0089_PW331_220608	0089_QC118_220608	0089_PW356_220608
				Sampling date / time	08-Jun-2022 13:01	08-Jun-2022 13:03	08-Jun-2022 13:09	08-Jun-2022 13:09	08-Jun-2022 13:10
Compound	CAS Number	LOR	Unit		EP2206970-006	EP2206970-007	EP2206970-008	EP2206970-009	EP2206970-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.10**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.10**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.10**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**99.2**	**108**	**106**	**95.8**
13C8-PFOA	----	0.02	%		**98.4**	**98.5**	**100**	**96.3**	**99.0**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW357_220608	----	----	----	----
				Sampling date / time	08-Jun-2022 13:15	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206970-012	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**275**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**275**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2510**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17600**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**505**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1530**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11100**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**619**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**554**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**650**	----	----	----	----
ø Ionic Balance	----	0.01	%		**7.94**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW358_220608	----	----	----	----
				Sampling date / time	08-Jun-2022 13:14	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206970-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**245**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**245**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2570**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17600**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**514**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1550**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11300**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**623**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**555**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**661**	----	----	----	----
ø Ionic Balance	----	0.01	%		**8.70**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW358_220608	----	----	----	----
				Sampling date / time	08-Jun-2022 13:14	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2206970-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	**0089_PW358_220608**	----	----	----	----
				Sampling date / time	08-Jun-2022 13:14	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2206970-011**	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.5**	----	----	----	----
13C8-PFOA	----	0.02	%		**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206970**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38697	Issue Date	: 21-Jun-2022
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4405564)									
EP2206970-010	0089_PW356_220608	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	235	235	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	235	235	0.0	0% - 20%
EP2206916-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	162	166	2.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	162	166	2.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4396042)									
EP2207142-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	11900	12200	2.3	0% - 20%
EP2207142-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3060	3020	1.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4396045)									
EP2206970-007	0089_SW150_220608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2770	2510	9.9	0% - 20%
EP2206971-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	42	42	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4396041)									
EP2207142-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	110000	124000	12.0	0% - 20%
EP2207142-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	124000	124000	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4396044)									
EP2206970-007	0089_SW150_220608	ED045G: Chloride	16887-00-6	1	mg/L	17500	17500	0.0	0% - 20%
EP2206971-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	50	51	2.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4395469)									
EP2206969-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	32	32	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	4	4	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED093F: Dissolved Major Cations (QC Lot: 4395469) - continued									
EP2206969-007	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP2206950-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	10	10	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	5	5	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	30	30	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4395470)									
EP2206970-008	0089_PW331_220608	ED093F: Calcium	7440-70-2	1	mg/L	529	503	5.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1610	1530	5.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11200	5.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	654	619	5.6	0% - 20%
EP2206973-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	531	531	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1600	1600	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11600	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	647	652	0.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2206970-010	0089_PW356_220608	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.09	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4403289)									
EP2207044-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.07	0.06	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4402594) - continued									
EP2206969-001	Anonymous	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2206970-010	0089_PW356_220608	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4403289)									
EP2207044-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4402594) - continued									
EP2206969-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2206970-010	0089_PW356_220608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4403289)									
EP2207044-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4402594) - continued									
EP2206969-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2206970-010	0089_PW356_220608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4403289)									
EP2207044-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4402594)									
EP2206969-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2206970-010	0089_PW356_220608	EP231X: Sum of PFAS	----	0.01	µg/L	0.10	0.11	9.5	0% - 50%
EP231P: PFAS Sums (QC Lot: 4403289)									
EP2207044-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.15	0.14	6.9	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4405564)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	106	81.2	126
				<1	200 mg/L	98.1	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396042)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.6	87.7	113
				<1	500 mg/L	89.2	87.7	113
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396045)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	87.7	113
				<1	500 mg/L	100	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4396041)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.9	87.9	114
				<1	1000 mg/L	106	87.9	114
ED045G: Chloride by Discrete Analyser (QCLot: 4396044)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.1	87.9	114
				<1	1000 mg/L	96.4	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4395469)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.7	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.0	89.7	108
ED093F: Dissolved Major Cations (QCLot: 4395470)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.7	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402594)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	104	65.0	140

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402594) - continued								
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	112	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403289)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	87.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	92.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	87.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	97.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402594)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	118	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	122	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	114	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	121	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403289)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	72.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	100	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	98.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402594)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	106	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	66.0	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402594) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403289)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	102	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	100	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	100	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.4	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	88.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	87.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	85.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402594)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	121	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	125	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	117	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	142	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403289)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	80.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	92.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	90.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	92.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396042)							
EP2207142-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396045)							
EP2206970-007	0089_SW150_220608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4396041)							
EP2207142-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4396044)							
EP2206970-007	0089_SW150_220608	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4402594)							
EP2206970-003	0089_SW154_220608	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	99.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	107	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	98.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	111	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	101	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403289)							
EP2207044-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	93.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	104	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	95.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	87.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	99.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4402594)							
EP2206970-003	0089_SW154_220608	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	114	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	109	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	114	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	119	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	115	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	110	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	119	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	123	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	97.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403289)							
EP2207044-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.6	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	90.0	72.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403289) - continued							
EP2207044-003	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	106	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	84.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	101	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	85.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	97.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	98.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4402594)							
EP2206970-003	0089_SW154_220608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	104	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	112	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.0	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	96.1	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	112	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	109	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403289)							
EP2207044-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.7	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	83.3	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	89.8	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	101	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	98.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402594)							
EP2206970-003	0089_SW154_220608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	106	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	128	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	99.2	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4402594) - continued							
EP2206970-003	0089_SW154_220608	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	128	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403289)							
EP2207044-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	115	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	111	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206970**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling SW/PW - MB	Issue Date	: 21-Jun-2022
Sampler	: [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2207142--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206970--007	0089_SW150_220608	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2207142--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206970--007	0089_SW150_220608	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	38	7.89	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW330_220608,	0089_SW154_220608,	**08-Jun-2022**	**----**	----	----	**17-Jun-2022**	22-Jun-2022	✓
0089_SW152_220608,	0089_PW329_220608,							
0089_SW156_220608,	0089_SW150_220608,							
0089_PW331_220608,	0089_PW356_220608,							
0089_PW358_220608,	0089_PW357_220608							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW330_220608, 0089_SW154_220608, 0089_SW152_220608, 0089_PW329_220608, 0089_SW156_220608	**08-Jun-2022**	**----**	----	----	**15-Jun-2022**	06-Jul-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_SW150_220608, 0089_PW331_220608, 0089_PW356_220608, 0089_PW358_220608, 0089_PW357_220608	**08-Jun-2022**	**----**	----	----	**17-Jun-2022**	06-Jul-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW330_220608, 0089_SW154_220608, 0089_SW152_220608, 0089_PW329_220608, 0089_SW156_220608	**08-Jun-2022**	**----**	----	----	**15-Jun-2022**	06-Jul-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_SW150_220608, 0089_PW331_220608, 0089_PW356_220608, 0089_PW358_220608, 0089_PW357_220608	**08-Jun-2022**	**----**	----	----	**17-Jun-2022**	06-Jul-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW330_220608, 0089_SW154_220608, 0089_SW152_220608, 0089_PW329_220608, 0089_SW156_220608, 0089_SW150_220608, 0089_PW331_220608, 0089_PW356_220608, 0089_PW358_220608, 0089_PW357_220608	**08-Jun-2022**	**----**	----	----	**13-Jun-2022**	15-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW330_220608, 0089_QC117_220608, 0089_SW154_220608, 0089_SW152_220608, 0089_PW329_220608, 0089_SW156_220608, 0089_SW150_220608, 0089_PW331_220608, 0089_QC118_220608, 0089_PW356_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X)							
0089_PW358_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW330_220608, 0089_QC117_220608, 0089_SW154_220608, 0089_SW152_220608, 0089_PW329_220608, 0089_SW156_220608, 0089_SW150_220608, 0089_PW331_220608, 0089_QC118_220608, 0089_PW356_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X)							
0089_PW358_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW330_220608, 0089_QC117_220608, 0089_SW154_220608, 0089_SW152_220608, 0089_PW329_220608, 0089_SW156_220608, 0089_SW150_220608, 0089_PW331_220608, 0089_QC118_220608, 0089_PW356_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X)							
0089_PW358_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW330_220608, 0089_QC117_220608, 0089_SW154_220608, 0089_SW152_220608, 0089_PW329_220608, 0089_SW156_220608, 0089_SW150_220608, 0089_PW331_220608, 0089_QC118_220608, 0089_PW356_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X)							
0089_PW358_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW330_220608, 0089_QC117_220608, 0089_SW154_220608, 0089_SW152_220608, 0089_PW329_220608, 0089_SW156_220608, 0089_SW150_220608, 0089_PW331_220608, 0089_QC118_220608, 0089_PW356_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**16-Jun-2022**	05-Dec-2022	✓
HDPE (no PTFE) (EP231X)							
0089_PW358_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	38	**7.89**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **38704** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW128		08/06/2022 08:57 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_MW172		08/06/2022 10:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_MW217		08/06/2022 10:50 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW282		08/06/2022 11:05 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_MW224		08/06/2022 11:34 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_MW220		08/06/2022 11:56 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW202		08/06/2022 01:37 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_MW288		08/06/2022 02:36 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
009	0089_MW258		08/06/2022 03:10 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: **38704** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW128	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW172	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW217	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW282	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW224	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW220	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW202	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW288	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW258	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 38704 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW128	Clear Plastic Bottle - Natural	500 mL	00071121102381	Green	No	
001	0089_MW128	HDPE (no PTFE)	20 mL	00350621067976	Grey	No	
001	0089_MW128	HDPE (no PTFE)	20 mL	00350621067724	Grey	No	
002	0089_MW172	Clear Plastic Bottle - Natural	500 mL	00071121102418	Green	No	
002	0089_MW172	HDPE (no PTFE)	20 mL	00352101073825	Grey	No	
002	0089_MW172	HDPE (no PTFE)	20 mL	00352101073467	Grey	No	
003	0089_MW217	HDPE (no PTFE)	20 mL	00352101073753	Grey	No	
003	0089_MW217	HDPE (no PTFE)	20 mL	00352101073535	Grey	No	
003	0089_MW217	Clear Plastic Bottle - Natural	500 mL	00071121102387	Green	No	
004	0089_MW282	Clear Plastic Bottle - Natural	500 mL	00071121102345	Green	No	
004	0089_MW282	HDPE (no PTFE)	20 mL	00352101073760	Grey	No	
004	0089_MW282	HDPE (no PTFE)	20 mL	00352101073874	Grey	No	
005	0089_MW224	Clear Plastic Bottle - Natural	500 mL	00071121102396	Green	No	
005	0089_MW224	HDPE (no PTFE)	20 mL	00352101073781	Grey	No	
005	0089_MW224	HDPE (no PTFE)	20 mL	00352101073865	Grey	No	
006	0089_MW220	Clear Plastic Bottle - Natural	500 mL	00071121102351	Green	No	
006	0089_MW220	HDPE (no PTFE)	20 mL	00352101073605	Grey	No	
006	0089_MW220	HDPE (no PTFE)	20 mL	00352101073636	Grey	No	
007	0089_MW202	Clear Plastic Bottle - Natural	500 mL	00071121102409	Green	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00352101073945	Grey	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00352101073896	Grey	No	
008	0089_MW288	Clear Plastic Bottle - Natural	500 mL	00071121102314	Green	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00352101058268	Grey	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00352101058234	Grey	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00350621046549	Grey	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00352101073957	Grey	No	

CHAIN OF CUSTODY

COC#: **38704** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

009	0089_MW258	Clear Plastic Bottle - Natural	500 mL	00071121102305	Green	No	
009	0089_MW258	HDPE (no PTFE)	20 mL	00352101073436	Grey	No	
009	0089_MW258	HDPE (no PTFE)	20 mL	00352101073992	Grey	No	

Total Bottle Count: ALS: 29, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206971**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38704	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Jun-2022 12:00	Issue Date	: 13-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 17.9 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206971-001	08-Jun-2022 08:57	0089_MW128_220608	✓	✓	✓	✓
EP2206971-002	08-Jun-2022 10:21	0089_MW172_220608	✓	✓	✓	✓
EP2206971-003	08-Jun-2022 10:50	0089_MW217_220608	✓	✓	✓	✓
EP2206971-004	08-Jun-2022 11:05	0089_MW282_220608	✓	✓	✓	✓
EP2206971-005	08-Jun-2022 11:34	0089_MW224_220608	✓	✓	✓	✓
EP2206971-006	08-Jun-2022 11:56	0089_MW220_220608	✓	✓	✓	✓
EP2206971-007	08-Jun-2022 13:37	0089_MW202_220608	✓	✓	✓	✓
EP2206971-008	08-Jun-2022 14:36	0089_MW288_220608	✓	✓	✓	✓
EP2206971-009	08-Jun-2022 15:10	0089_MW258_220608	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206971**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: 38704	Issue Date	: 21-Jun-2022 16:49
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic Balance out of acceptable limits for sample #3 and 8 due to analytes not quantified in this report. Major cations (ED093F) and major anions (ED041G/ED045G) have been confirmed by re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW128_220608	0089_MW172_220608	0089_MW217_220608	0089_MW282_220608	0089_MW224_220608
				Sampling date / time	08-Jun-2022 08:57	08-Jun-2022 10:21	08-Jun-2022 10:50	08-Jun-2022 11:05	08-Jun-2022 11:34
					EP2206971-001	EP2206971-002	EP2206971-003	EP2206971-004	EP2206971-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**462**	**455**	**268**	**535**	**242**
Total Alkalinity as CaCO3	----	1	mg/L		**462**	**455**	**268**	**535**	**242**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**17**	**222**	**50**	**16**	**41**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**41**	**1190**	**51**	**54**	**113**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**106**	**119**	**129**	**211**	**67**
Magnesium	7439-95-4	1	mg/L		**30**	**153**	**15**	**26**	**25**
Sodium	7440-23-5	1	mg/L		**40**	**806**	**40**	**41**	**95**
Potassium	7440-09-7	1	mg/L		**5**	**64**	**10**	<1	**5**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**10.7**	**47.3**	**7.83**	**12.5**	**8.88**
ø Total Cations	----	0.01	meq/L		**9.63**	**55.2**	**9.67**	**14.4**	**9.66**
ø Ionic Balance	----	0.01	%		**5.47**	**7.75**	**10.5**	**7.06**	**4.23**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**1.79**	**0.02**	**1.30**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**1.32**	**0.02**	**3.44**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.32**	**6.70**	**0.02**	**23.7**	**0.02**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.05**	**1.63**	<0.02	**4.29**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**6.22**	**6.47**	**0.06**	**71.3**	**0.08**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.6**	**1.5**	**0.6**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.72**	**4.56**	**1.11**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.03**	**3.23**	**5.57**	**3.72**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.28**	**0.88**	**1.44**	<0.02

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW128_220608	0089_MW172_220608	0089_MW217_220608	0089_MW282_220608	0089_MW224_220608
				Sampling date / time	08-Jun-2022 08:57	08-Jun-2022 10:21	08-Jun-2022 10:50	08-Jun-2022 11:05	08-Jun-2022 11:34
					EP2206971-001	EP2206971-002	EP2206971-003	EP2206971-004	EP2206971-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.06**	**0.66**	**0.38**	**4.10**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	**0.04**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	**20.7**	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	**0.21**	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW128_220608	0089_MW172_220608	0089_MW217_220608	0089_MW282_220608	0089_MW224_220608
				Sampling date / time	08-Jun-2022 08:57	08-Jun-2022 10:21	08-Jun-2022 10:50	08-Jun-2022 11:05	08-Jun-2022 11:34
					EP2206971-001	EP2206971-002	EP2206971-003	EP2206971-004	EP2206971-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**6.68**	**23.4**	**33.9**	**115**	**0.10**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**6.54**	**13.2**	**0.08**	**95.0**	**0.10**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**6.63**	**20.4**	**33.9**	**107**	**0.10**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**88.2**	**100**	**77.1**	**102**
13C8-PFOA	----	0.02	%		**95.3**	**102**	**98.9**	**102**	**98.2**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW220_220608	0089_MW202_220608	0089_MW288_220608	0089_MW258_220608	----
				Sampling date / time	08-Jun-2022 11:56	08-Jun-2022 13:37	08-Jun-2022 14:36	08-Jun-2022 15:10	----
Compound	CAS Number	LOR	Unit		EP2206971-006	EP2206971-007	EP2206971-008	EP2206971-009	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		340	382	271	353	----
Total Alkalinity as CaCO3	----	1	mg/L		340	382	271	353	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		43	90	44	88	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		50	367	54	80	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		128	139	121	130	----
Magnesium	7439-95-4	1	mg/L		21	44	24	33	----
Sodium	7440-23-5	1	mg/L		58	230	40	72	----
Potassium	7440-09-7	1	mg/L		13	18	5	14	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		9.10	19.8	7.85	11.1	----
ø Total Cations	----	0.01	meq/L		11.0	21.0	9.88	12.7	----
ø Ionic Balance	----	0.01	%		9.33	2.84	11.4	6.51	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.25	<0.02	<0.02	1.30	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.18	<0.02	<0.02	0.84	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		4.02	0.04	0.05	2.35	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.53	<0.02	<0.02	0.08	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		23.5	0.04	2.98	2.06	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.2	<0.1	<0.1	0.2	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.49	<0.02	<0.02	0.43	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.94	<0.02	0.02	1.30	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.19	<0.02	<0.02	0.10	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW220_220608	0089_MW202_220608	0089_MW288_220608	0089_MW258_220608	----
				Sampling date / time	08-Jun-2022 11:56	08-Jun-2022 13:37	08-Jun-2022 14:36	08-Jun-2022 15:10	----
Compound	CAS Number	LOR	Unit		EP2206971-006	EP2206971-007	EP2206971-008	EP2206971-009	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.51**	<0.01	<0.01	**0.06**	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.08**	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW220_220608	0089_MW202_220608	0089_MW288_220608	0089_MW258_220608	----
				Sampling date / time	08-Jun-2022 11:56	08-Jun-2022 13:37	08-Jun-2022 14:36	08-Jun-2022 15:10	----
Compound	CAS Number	LOR	Unit		EP2206971-006	EP2206971-007	EP2206971-008	EP2206971-009	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**30.9**	**0.08**	**3.05**	**8.72**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**27.5**	**0.08**	**3.03**	**4.41**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**30.2**	**0.08**	**3.05**	**7.80**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**92.4**	**100**	**92.3**	----
13C8-PFOA	----	0.02	%		**102**	**98.7**	**97.9**	**93.5**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206971**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: 38704	Issue Date	: 21-Jun-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4405564)									
EP2206970-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	235	235	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	235	235	0.0	0% - 20%
EP2206916-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	162	166	2.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	162	166	2.2	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4405565)									
EP2206971-008	0089_MW288_220608	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	271	272	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	271	272	0.5	0% - 20%
EP2207007-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	165	164	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	165	164	0.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4396045)									
EP2206970-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2770	2510	9.9	0% - 20%
EP2206971-006	0089_MW220_220608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	43	43	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4396044)									
EP2206970-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17500	17500	0.0	0% - 20%
EP2206971-006	0089_MW220_220608	ED045G: Chloride	16887-00-6	1	mg/L	50	51	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4395954)									
EP2206971-001	0089_MW128_220608	ED093F: Calcium	7440-70-2	1	mg/L	106	106	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	30	30	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	40	40	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
EP2207180-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	716	714	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	6410	6420	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	96200	96000	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2940	2950	0.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4403328)									
EP2206971-008	0089_MW288_220608	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.98	3.08	3.3	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2207028-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	3.12	3.69	16.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	10.7	12.1	12.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.51	0.53	3.7	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.44	0.48	9.9	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.39	0.39	0.0	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4403328)									
EP2206971-008	0089_MW288_220608	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2207028-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.42	0.46	9.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.40	0.40	0.0	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.32	1.40	6.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.16	0.17	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.03	0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4403328) - continued									
EP2207028-002	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	0.3	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4403328)									
EP2206971-008	0089_MW288_220608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2207028-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	0.08	0.09	16.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4403328)									
EP2206971-008	0089_MW288_220608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4403328) - continued									
EP2207028-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.16	0.21	31.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4403328)									
EP2206971-008	0089_MW288_220608	EP231X: Sum of PFAS	----	0.01	µg/L	3.05	3.15	3.2	0% - 20%
EP2207028-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	17.9	20.2	12.1	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4405564)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	106	81.2	126
				<1	200 mg/L	98.1	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4405565)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	97.8	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396045)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	87.7	113
				<1	500 mg/L	100	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4396044)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.1	87.9	114
				<1	1000 mg/L	96.4	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4395954)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	110	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	110	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	115	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403328)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	119	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	118	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	121	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403328)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	96.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403328) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	120	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	118	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	116	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	126	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403328)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	134	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	108	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	136	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	100	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403328)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	136	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	134	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	126	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396045)							
EP2206970-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4396044)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 4396044) - continued							
EP2206970-007	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403328)							
EP2207028-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	106	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	109	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	116	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	102	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	130	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	124	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403328)							
EP2207028-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.8	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	128	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	121	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	119	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	114	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	117	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	118	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	120	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	116	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	109	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403328)							
EP2207028-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	123	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	93.8	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	98.4	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	98.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	123	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403328)							
EP2207028-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	99.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	95.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	111	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403328) - continued							
EP2207028-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	143	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206971**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling GW - AG	Issue Date	: 21-Jun-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206970--007	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206970--007	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW128_220608, 0089_MW172_220608, 0089_MW217_220608, 0089_MW282_220608, 0089_MW224_220608, 0089_MW220_220608, 0089_MW202_220608, 0089_MW288_220608, 0089_MW258_220608	**08-Jun-2022**	**----**	----	----	**17-Jun-2022**	22-Jun-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW128_220608, 0089_MW172_220608, 0089_MW217_220608, 0089_MW282_220608, 0089_MW224_220608, 0089_MW220_220608, 0089_MW202_220608, 0089_MW288_220608, 0089_MW258_220608	**08-Jun-2022**	**----**	----	----	**17-Jun-2022**	06-Jul-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW128_220608, 0089_MW172_220608, 0089_MW217_220608, 0089_MW282_220608, 0089_MW224_220608, 0089_MW220_220608, 0089_MW202_220608, 0089_MW288_220608, 0089_MW258_220608	**08-Jun-2022**	**----**	----	----	**17-Jun-2022**	06-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW128_220608, 0089_MW172_220608, 0089_MW217_220608, 0089_MW282_220608, 0089_MW224_220608, 0089_MW220_220608, 0089_MW202_220608, 0089_MW288_220608, 0089_MW258_220608	**08-Jun-2022**	**----**	----	----	**14-Jun-2022**	15-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW128_220608, 0089_MW172_220608, 0089_MW217_220608, 0089_MW282_220608, 0089_MW224_220608, 0089_MW220_220608, 0089_MW202_220608, 0089_MW288_220608, 0089_MW258_220608	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW128_220608, 0089_MW172_220608, 0089_MW217_220608, 0089_MW282_220608, 0089_MW224_220608, 0089_MW220_220608, 0089_MW202_220608, 0089_MW288_220608, 0089_MW258_220608	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW128_220608, 0089_MW172_220608, 0089_MW217_220608, 0089_MW282_220608, 0089_MW224_220608, 0089_MW220_220608, 0089_MW202_220608, 0089_MW288_220608, 0089_MW258_220608	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW128_220608, 0089_MW172_220608, 0089_MW217_220608, 0089_MW282_220608, 0089_MW224_220608, 0089_MW220_220608, 0089_MW202_220608, 0089_MW288_220608, 0089_MW258_220608	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW128_220608, 0089_MW172_220608, 0089_MW217_220608, 0089_MW282_220608, 0089_MW224_220608, 0089_MW220_220608, 0089_MW202_220608, 0089_MW288_220608, 0089_MW258_220608	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 38731 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES TO [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD368		08/06/2022 12:56 PM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD304		08/06/2022 01:19 PM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD346		08/06/2022 02:21 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **38731** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD368	HDPE Soil Jar	200 mL	00620322041461	Grey	No	
002	0089_SD304	HDPE Soil Jar	200 mL	00620322041394	Grey	No	
003	0089_SD346	HDPE Soil Jar	200 mL	00620322041397	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2206972**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38731	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Jun-2022 12:00	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 21-Jun-2022	Scheduled Reporting Date	: **21-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 17.9 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2206972-001	08-Jun-2022 12:56	0089_SD368_220608	✓	✓
EP2206972-002	08-Jun-2022 13:19	0089_SD304_220608	✓	✓
EP2206972-003	08-Jun-2022 14:21	0089_SD346_220608	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206972**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Jun-2022
C-O-C number	: 38731	Issue Date	: 21-Jun-2022 09:11
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD368_220608	0089_SD304_220608	0089_SD346_220608	----	----
			Sampling date / time	08-Jun-2022 12:56	08-Jun-2022 13:19	08-Jun-2022 14:21	----	----
Compound	CAS Number	LOR	Unit	EP2206972-001	EP2206972-002	EP2206972-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**33.4**	**27.1**	**35.6**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0005**	<0.0002	**0.0019**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD368_220608	0089_SD304_220608	0089_SD346_220608	----	----
				Sampling date / time	08-Jun-2022 12:56	08-Jun-2022 13:19	08-Jun-2022 14:21	----	----
Compound	CAS Number	LOR	Unit		EP2206972-001	EP2206972-002	EP2206972-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0005**	<0.0002	**0.0019**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0005**	<0.0002	**0.0019**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0005**	<0.0002	**0.0019**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**93.0**	**92.5**	----	----
13C8-PFOA	----	0.0002	%		**114**	**105**	**105**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206972**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Jun-2022
C-O-C number	: 38731	Issue Date	: 21-Jun-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4407146)									
EP2206886-006	Anonymous	EA055: Moisture Content	----	0.1	%	26.6	26.7	0.0	0% - 20%
EP2206968-003	Anonymous	EA055: Moisture Content	----	0.1	%	20.4	19.3	5.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4404257)									
EP2206968-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2220380-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0105	0.0086	19.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4404257)									
EP2206968-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4404257) - continued									
EP2206968-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2220380-009	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0004	0.0003	35.9	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0003	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0012	0.0009	22.7	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0005	0.0004	26.8	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4404257)									
EP2206968-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2220380-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4404257)									
EP2206968-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2220380-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4404257)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	123	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4404257)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	111	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	121	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	118	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4404257)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	126	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	122	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	117	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	120	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4404257)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	105	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	125	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	120	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4404257) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	120	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4404257)							
EP2206968-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	113	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	123	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	113	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	109	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	102	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	120	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4404257)							
EP2206968-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	110	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	122	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	122	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	118	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	121	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	116	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	120	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	120	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	126	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	115	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4404257)							
EP2206968-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	123	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	109	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	120	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	115	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	115	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	117	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4404257) - continued							
EP2206968-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	113	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4404257)							
EP2206968-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	114	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	123	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	116	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	121	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206972**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling SD - AG	Issue Date	: 21-Jun-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD368_220608, 0089_SD346_220608	0089_SD304_220608,	**08-Jun-2022**	**----**	----	----	**18-Jun-2022**	22-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD368_220608, 0089_SD346_220608	0089_SD304_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD368_220608, 0089_SD346_220608	0089_SD304_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD368_220608, 0089_SD346_220608	0089_SD304_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD368_220608, 0089_SD346_220608	0089_SD304_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD368_220608, 0089_SD346_220608	0089_SD304_220608,	**08-Jun-2022**	**17-Jun-2022**	05-Dec-2022	✓	**20-Jun-2022**	27-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: **38732** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW368		08/06/2022 12:57 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_SW371		08/06/2022 01:05 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_SW305		08/06/2022 01:17 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_PW304		08/06/2022 01:20 PM	Water	ALS: 3 Non ALS: 0	No	Partial 3/8		
005	0089_SW372		08/06/2022 01:59 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab qaqc
006	0089_SW373		08/06/2022 02:13 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW346		08/06/2022 02:20 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: **38732** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW368	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW371	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW305	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW304	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW372	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW373	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW346	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 38732 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - AG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW368	HDPE (no PTFE)	20 mL	00352101073652	Grey	No	
001	0089_PW368	HDPE (no PTFE)	20 mL	00352101073940	Grey	No	
001	0089_PW368	Clear Plastic Bottle - Natural	500 mL	00071121102415	Green	No	
002	0089_SW371	Clear Plastic Bottle - Natural	500 mL	00071121102250	Green	No	
002	0089_SW371	HDPE (no PTFE)	20 mL	00352101073640	Grey	No	
002	0089_SW371	HDPE (no PTFE)	20 mL	00352101073654	Grey	No	
003	0089_SW305	Clear Plastic Bottle - Natural	500 mL	00071121102441	Green	No	
003	0089_SW305	HDPE (no PTFE)	20 mL	00352101073789	Grey	No	
003	0089_SW305	HDPE (no PTFE)	20 mL	00352101073918	Grey	No	
004	0089_PW304	Clear Plastic Bottle - Natural	500 mL	00071121102386	Green	No	
004	0089_PW304	HDPE (no PTFE)	20 mL	00352101073660	Grey	No	
004	0089_PW304	HDPE (no PTFE)	20 mL	00352101073488	Grey	No	
005	0089_SW372	Clear Plastic Bottle - Natural	500 mL	00071121102228	Green	No	
005	0089_SW372	HDPE (no PTFE)	20 mL	00350621067862	Grey	No	
005	0089_SW372	HDPE (no PTFE)	20 mL	00350621067765	Grey	No	
005	0089_SW372	HDPE (no PTFE)	20 mL	00350621041361	Grey	No	
005	0089_SW372	HDPE (no PTFE)	20 mL	00352101057959	Grey	No	
006	0089_SW373	Clear Plastic Bottle - Natural	500 mL	00071121102442	Green	No	
006	0089_SW373	HDPE (no PTFE)	20 mL	00352101073502	Grey	No	
006	0089_SW373	HDPE (no PTFE)	20 mL	00352101074028	Grey	No	
007	0089_PW346	HDPE (no PTFE)	20 mL	00352101073616	Grey	No	
007	0089_PW346	HDPE (no PTFE)	20 mL	00352101073857	Grey	No	
007	0089_PW346	Clear Plastic Bottle - Natural	500 mL	00071121102321	Green	No	

Total Bottle Count: ALS: 23, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2206973**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38732	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - AG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Jun-2022 12:00	Issue Date	: 13-Jun-2022
Client Requested Due Date	: 22-Jun-2022	Scheduled Reporting Date	: **22-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 17.9 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2206973-001	08-Jun-2022 12:57	0089_PW368_220608	✓	✓	✓	✓
EP2206973-002	08-Jun-2022 13:05	0089_SW371_220608	✓	✓	✓	✓
EP2206973-003	08-Jun-2022 13:17	0089_SW305_220608	✓	✓	✓	✓
EP2206973-004	08-Jun-2022 13:20	0089_PW304_220608	✓	✓	✓	✓
EP2206973-005	08-Jun-2022 13:59	0089_SW372_220608	✓	✓	✓	✓
EP2206973-006	08-Jun-2022 14:13	0089_SW373_220608	✓	✓	✓	✓
EP2206973-007	08-Jun-2022 14:20	0089_PW346_220608	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2206973**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38732	Issue Date	: 20-Jun-2022 15:37
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW368_220608	0089_SW371_220608	0089_SW305_220608	0089_PW304_220608	0089_SW372_220608
				Sampling date / time	08-Jun-2022 12:57	08-Jun-2022 13:05	08-Jun-2022 13:17	08-Jun-2022 13:20	08-Jun-2022 13:59
Compound	CAS Number	LOR	Unit		EP2206973-001	EP2206973-002	EP2206973-003	EP2206973-004	EP2206973-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		128	132	127	285	121
Total Alkalinity as CaCO3	----	1	mg/L		128	132	127	285	121
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2850	2780	2760	2610	2900
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19100	19200	19300	17300	18900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		489	477	492	452	483
Magnesium	7439-95-4	1	mg/L		1590	1550	1600	1360	1580
Sodium	7440-23-5	1	mg/L		11600	11300	11700	9700	11500
Potassium	7440-09-7	1	mg/L		639	624	642	542	636
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		601	602	604	548	596
ø Total Cations	----	0.01	meq/L		676	659	682	570	671
ø Ionic Balance	----	0.01	%		5.91	4.50	6.00	1.99	5.90
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.06	0.02	0.01	<0.01	0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.27	0.18	0.22	0.02	0.09
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW368_220608	0089_SW371_220608	0089_SW305_220608	0089_PW304_220608	0089_SW372_220608
				Sampling date / time	08-Jun-2022 12:57	08-Jun-2022 13:05	08-Jun-2022 13:17	08-Jun-2022 13:20	08-Jun-2022 13:59
Compound	CAS Number	LOR	Unit		EP2206973-001	EP2206973-002	EP2206973-003	EP2206973-004	EP2206973-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW368_220608	0089_SW371_220608	0089_SW305_220608	0089_PW304_220608	0089_SW372_220608
				Sampling date / time	08-Jun-2022 12:57	08-Jun-2022 13:05	08-Jun-2022 13:17	08-Jun-2022 13:20	08-Jun-2022 13:59
Compound	CAS Number	LOR	Unit		EP2206973-001	EP2206973-002	EP2206973-003	EP2206973-004	EP2206973-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.33**	**0.20**	**0.23**	**0.02**	**0.11**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.33**	**0.20**	**0.23**	**0.02**	**0.11**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.33**	**0.20**	**0.23**	**0.02**	**0.11**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.1**	**86.6**	**84.5**	**87.4**	**81.8**
13C8-PFOA	----	0.02	%		**98.4**	**98.9**	**101**	**105**	**105**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_220608	0089_PW346_220608	----	----	----
				Sampling date / time	08-Jun-2022 14:13	08-Jun-2022 14:20	----	----	----
Compound	CAS Number	LOR	Unit		EP2206973-006	EP2206973-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**121**	**313**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**121**	**313**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2860**	**2960**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18800**	**19600**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**478**	**531**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1560**	**1600**	----	----	----
Sodium	7440-23-5	1	mg/L		**11400**	**11500**	----	----	----
Potassium	7440-09-7	1	mg/L		**627**	**647**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**592**	**621**	----	----	----
ø Total Cations	----	0.01	meq/L		**664**	**675**	----	----	----
ø Ionic Balance	----	0.01	%		**5.72**	**4.18**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.06**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.42**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_220608	0089_PW346_220608	----	----	----
				Sampling date / time	08-Jun-2022 14:13	08-Jun-2022 14:20	----	----	----
Compound	CAS Number	LOR	Unit		EP2206973-006	EP2206973-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.01**	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_220608	0089_PW346_220608	----	----	----
				Sampling date / time	08-Jun-2022 14:13	08-Jun-2022 14:20	----	----	----
Compound	CAS Number	LOR	Unit		EP2206973-006	EP2206973-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.49**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.48**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.49**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**87.5**	**84.8**	----	----	----
13C8-PFOA	----	0.02	%		**109**	**107**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2206973**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38732	Issue Date	: 20-Jun-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - AG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4405565)									
EP2206971-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	271	272	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	271	272	0.5	0% - 20%
EP2207007-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	165	164	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	165	164	0.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4396047)									
EP2206973-001	0089_PW368_220608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2850	2840	0.5	0% - 20%
EP2207028-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	14	14	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 4396046)									
EP2206973-001	0089_PW368_220608	ED045G: Chloride	16887-00-6	1	mg/L	19100	19100	0.1	0% - 20%
EP2207028-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19	20	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 4395470)									
EP2206970-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	529	503	5.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1610	1530	5.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11200	5.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	654	619	5.6	0% - 20%
EP2206973-007	0089_PW346_220608	ED093F: Calcium	7440-70-2	1	mg/L	531	531	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1600	1600	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11600	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	647	652	0.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4403725)									
EP2206973-005	0089_SW372_220608	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	0.10	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2207029-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4403725)									
EP2206973-005	0089_SW372_220608	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2207029-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4403725)									
EP2206973-005	0089_SW372_220608	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4403725) - continued									
EP2206973-005	0089_SW372_220608	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2207029-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4403725)									
EP2206973-005	0089_SW372_220608	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2207029-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4403725)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4403725) - continued									
EP2206973-005	0089_SW372_220608	EP231X: Sum of PFAS	----	0.01	µg/L	0.11	0.12	8.7	0% - 50%
EP2207029-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4405565)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	97.8	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396047)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	87.7	113
				<1	500 mg/L	101	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4396046)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	87.9	114
				<1	1000 mg/L	99.2	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4395470)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.7	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403725)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	75.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	105	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	103	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	107	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403725)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	75.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	112	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	90.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403725) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403725)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	93.8	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	105	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	118	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403725)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	95.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	81.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	81.0	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396047)							
EP2206973-001	0089_PW368_220608	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4396046)							
EP2206973-001	0089_PW368_220608	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403725)							
EP2207029-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	114	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	99.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	96.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	95.2	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403725) - continued							
EP2207029-006	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	110	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403725)							
EP2207029-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	83.5	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	113	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	119	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	101	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	111	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	115	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	120	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	128	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	126	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403725)							
EP2207029-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	118	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	108	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	95.8	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	105	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	108	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	122	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	115	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403725)							
EP2207029-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	86.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	97.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	99.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2206973**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling SW/PW - AG	Issue Date	: 20-Jun-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206973--001	0089_PW368_220608	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206973--001	0089_PW368_220608	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW368_220608, 0089_SW371_220608, 0089_SW305_220608, 0089_PW304_220608, 0089_SW372_220608, 0089_SW373_220608, 0089_PW346_220608	**08-Jun-2022**	**----**	----	----	**17-Jun-2022**	22-Jun-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW368_220608, 0089_SW371_220608, 0089_SW305_220608, 0089_PW304_220608, 0089_SW372_220608, 0089_SW373_220608, 0089_PW346_220608	**08-Jun-2022**	**----**	----	----	**20-Jun-2022**	06-Jul-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW368_220608, 0089_SW371_220608, 0089_SW305_220608, 0089_PW304_220608, 0089_SW372_220608, 0089_SW373_220608, 0089_PW346_220608	**08-Jun-2022**	**----**	----	----	**20-Jun-2022**	06-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW368_220608, 0089_SW371_220608, 0089_SW305_220608, 0089_PW304_220608, 0089_SW372_220608, 0089_SW373_220608, 0089_PW346_220608	**08-Jun-2022**	**----**	----	----	**13-Jun-2022**	15-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW368_220608, 0089_SW371_220608, 0089_SW305_220608, 0089_PW304_220608, 0089_SW372_220608, 0089_SW373_220608, 0089_PW346_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW368_220608, 0089_SW371_220608, 0089_SW305_220608, 0089_PW304_220608, 0089_SW372_220608, 0089_SW373_220608, 0089_PW346_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW368_220608, 0089_SW371_220608, 0089_SW305_220608, 0089_PW304_220608, 0089_SW372_220608, 0089_SW373_220608, 0089_PW346_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW368_220608, 0089_SW371_220608, 0089_SW305_220608, 0089_PW304_220608, 0089_SW372_220608, 0089_SW373_220608, 0089_PW346_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW368_220608, 0089_SW371_220608, 0089_SW305_220608, 0089_PW304_220608, 0089_SW372_220608, 0089_SW373_220608, 0089_PW346_220608	**08-Jun-2022**	**16-Jun-2022**	05-Dec-2022	✓	**17-Jun-2022**	05-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: **38739** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD378		09/06/2022 11:53 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD375		09/06/2022 12:25 PM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD374		09/06/2022 12:25 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 38739 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD378	HDPE Soil Jar	200 mL	00620322041490	Grey	No	
002	0089_SD375	HDPE Soil Jar	200 mL	00620322041469	Grey	No	
003	0089_SD374	HDPE Soil Jar	200 mL	00620322041467	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2207027**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38739	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Jun-2022 16:40	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 22-Jun-2022	Scheduled Reporting Date	: **22-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2207027-001	09-Jun-2022 11:53	0089_SD378_220609	✓	✓
EP2207027-002	09-Jun-2022 12:25	0089_SD375_220609	✓	✓
EP2207027-003	09-Jun-2022 12:25	0089_SD374_220609	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2207027**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 16:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Jun-2022
C-O-C number	: 38739	Issue Date	: 21-Jun-2022 13:02
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD378_220609	0089_SD375_220609	0089_SD374_220609	----	----
			Sampling date / time	09-Jun-2022 11:53	09-Jun-2022 12:25	09-Jun-2022 12:25	----	----
Compound	CAS Number	LOR	Unit	EP2207027-001	EP2207027-002	EP2207027-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**22.5**	**19.2**	**11.7**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0003**	**0.0003**	**0.0003**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD378_220609	0089_SD375_220609	0089_SD374_220609	----	----
				Sampling date / time	09-Jun-2022 11:53	09-Jun-2022 12:25	09-Jun-2022 12:25	----	----
Compound	CAS Number	LOR	Unit		EP2207027-001	EP2207027-002	EP2207027-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0003**	**0.0003**	**0.0003**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0003**	**0.0003**	**0.0003**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0003**	**0.0003**	**0.0003**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**79.0**	**83.0**	**99.0**	----	----
13C8-PFOA	----	0.0002	%		**118**	**100**	**93.5**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2207027**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 17-Jun-2022
C-O-C number	: 38739	Issue Date	: 21-Jun-2022
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4409195)									
EP2207027-003	0089_SD374_220609	EA055: Moisture Content	----	0.1	%	11.7	11.4	2.6	0% - 20%
ES2220774-002	Anonymous	EA055: Moisture Content	----	0.1	%	5.6	5.9	6.7	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4404260)									
EP2207027-001	0089_SD378_220609	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0004	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2220387-017	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4404260)									
EP2207027-001	0089_SD378_220609	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4404260) - continued									
EP2207027-001	0089_SD378_220609	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2220387-017	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4404260)									
EP2207027-001	0089_SD378_220609	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2220387-017	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4404260)									
EP2207027-001	0089_SD378_220609	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2220387-017	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4404260)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4404260)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	77.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4404260)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	125	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.8	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	126	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	118	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4404260)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	82.8	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	74.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	74.8	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4404260) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.2	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4404260)							
EP2207027-001	0089_SD378_220609	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	106	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	84.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	86.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	86.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	100	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	112	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4404260)							
EP2207027-001	0089_SD378_220609	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	99.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	76.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	118	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	87.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	115	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	108	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	95.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	122	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	108	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	105	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	112	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4404260)							
EP2207027-001	0089_SD378_220609	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	94.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	122	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	103	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	125	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	119	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	109	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4404260) - continued							
EP2207027-001	0089_SD378_220609	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	118	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4404260)							
EP2207027-001	0089_SD378_220609	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	87.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	80.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	76.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	94.0	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2207027**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling SD - MB	Issue Date	: 21-Jun-2022
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD378_220609, 0089_SD374_220609	0089_SD375_220609,	**09-Jun-2022**	**----**	----	----	**20-Jun-2022**	23-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD378_220609, 0089_SD374_220609	0089_SD375_220609,	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	27-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD378_220609, 0089_SD374_220609	0089_SD375_220609,	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	27-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD378_220609, 0089_SD374_220609	0089_SD375_220609,	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	27-Jul-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD378_220609, 0089_SD374_220609	0089_SD375_220609,	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	27-Jul-2022	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD378_220609, 0089_SD374_220609	0089_SD375_220609,	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	27-Jul-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 38740 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW259		09/06/2022 08:47 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab QC
002	0089_MW256		09/06/2022 09:05 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_MW255		09/06/2022 09:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_MW257		09/06/2022 09:34 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_MW245		09/06/2022 09:59 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_MW243		09/06/2022 10:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW240		09/06/2022 10:56 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_MW238		09/06/2022 10:57 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_MW239		09/06/2022 10:58 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 38740 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW269		09/06/2022 11:22 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab QC
011	0089_MW268		09/06/2022 11:37 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 38740 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW259	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW256	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW255	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW257	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW245	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW243	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW240	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW238	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW239	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 38740 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW239	Clear Plastic Bottle - Natural	500 mL	00071121102262	Green	No	
009	0089_MW239	HDPE (no PTFE)	20 mL	00350621067824	Grey	No	
009	0089_MW239	HDPE (no PTFE)	20 mL	00350621067920	Grey	No	
010	0089_MW269	Clear Plastic Bottle - Natural	500 mL	00071121102284	Green	No	
010	0089_MW269	HDPE (no PTFE)	20 mL	00352101073477	Grey	No	
010	0089_MW269	HDPE (no PTFE)	20 mL	00352101073989	Grey	No	
010	0089_MW269	HDPE (no PTFE)	20 mL	00350621067779	Grey	No	
010	0089_MW269	HDPE (no PTFE)	20 mL	00350621067386	Grey	No	
011	0089_MW268	Clear Plastic Bottle - Natural	500 mL	00071121102407	Green	No	
011	0089_MW268	HDPE (no PTFE)	20 mL	00350621067823	Grey	No	
011	0089_MW268	HDPE (no PTFE)	20 mL	00350621068018	Grey	No	

Total Bottle Count: ALS: 37, Non ALS: 0

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2207028**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38740	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Jun-2022 16:40	Issue Date	: 10-Jun-2022
Client Requested Due Date	: 22-Jun-2022	Scheduled Reporting Date	: **22-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2207028-001	09-Jun-2022 08:47	0089_MW259_220609	✓	✓	✓	✓
EP2207028-002	09-Jun-2022 09:05	0089_MW256_220609	✓	✓	✓	✓
EP2207028-003	09-Jun-2022 09:21	0089_MW255_220609	✓	✓	✓	✓
EP2207028-004	09-Jun-2022 09:34	0089_MW257_220609	✓	✓	✓	✓
EP2207028-005	09-Jun-2022 09:59	0089_MW245_220609	✓	✓	✓	✓
EP2207028-006	09-Jun-2022 10:21	0089_MW243_220609	✓	✓	✓	✓
EP2207028-007	09-Jun-2022 10:56	0089_MW240_220609	✓	✓	✓	✓
EP2207028-008	09-Jun-2022 10:57	0089_MW238_220609	✓	✓	✓	✓
EP2207028-009	09-Jun-2022 10:58	0089_MW239_220609	✓	✓	✓	✓
EP2207028-010	09-Jun-2022 11:22	0089_MW269_220609	✓	✓	✓	✓
EP2207028-011	09-Jun-2022 11:37	0089_MW268_220609	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2207028**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 16:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38740	Issue Date	: 21-Jun-2022 11:09
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: PFAS results for sample #008, #009 confirmed by re-extraction and re-analysis
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- EP231X: Samples EP2207028_001,003,004 required dilution due to sample matrix interferences and Internal Standard peak suppression. LOR values have been adjusted accordingly.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW259_220609	0089_MW256_220609	0089_MW255_220609	0089_MW257_220609	0089_MW245_220609
				Sampling date / time	09-Jun-2022 08:47	09-Jun-2022 09:05	09-Jun-2022 09:21	09-Jun-2022 09:34	09-Jun-2022 09:59
					EP2207028-001	EP2207028-002	EP2207028-003	EP2207028-004	EP2207028-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**186**	**516**	**262**	**368**	**460**
Total Alkalinity as CaCO3	----	1	mg/L		**186**	**516**	**262**	**368**	**460**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**13**	**49**	**38**	**14**	**7**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**26**	**585**	**74**	**19**	**30**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**57**	**174**	**97**	**66**	**152**
Magnesium	7439-95-4	1	mg/L		**14**	**75**	**15**	**9**	**20**
Sodium	7440-23-5	1	mg/L		**14**	**253**	**55**	**18**	**31**
Potassium	7440-09-7	1	mg/L		**1**	**8**	**5**	**3**	**8**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**4.72**	**27.8**	**8.11**	**8.18**	**10.2**
ø Total Cations	----	0.01	meq/L		**4.63**	**26.1**	**8.60**	**4.89**	**10.8**
ø Ionic Balance	----	0.01	%		**0.95**	**3.28**	**2.88**	**25.1**	**2.87**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.51**	<0.05	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.05	**0.44**	**0.09**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.05	**3.12**	**1.40**	<0.05	**0.04**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.39**	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.11**	**10.7**	**0.14**	**0.06**	**0.03**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.2	**0.2**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.16**	**0.40**	<0.05	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.09**	**1.32**	**0.10**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.05	**0.16**	<0.05	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW259_220609	0089_MW256_220609	0089_MW255_220609	0089_MW257_220609	0089_MW245_220609
				Sampling date / time	09-Jun-2022 08:47	09-Jun-2022 09:05	09-Jun-2022 09:21	09-Jun-2022 09:34	09-Jun-2022 09:59
Compound	CAS Number	LOR	Unit		EP2207028-001	EP2207028-002	EP2207028-003	EP2207028-004	EP2207028-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.42**	<0.05	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.03**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	**0.08**	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	**0.16**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW259_220609	0089_MW256_220609	0089_MW255_220609	0089_MW257_220609	0089_MW245_220609
				Sampling date / time	09-Jun-2022 08:47	09-Jun-2022 09:05	09-Jun-2022 09:21	09-Jun-2022 09:34	09-Jun-2022 09:59
Compound	CAS Number	LOR	Unit		EP2207028-001	EP2207028-002	EP2207028-003	EP2207028-004	EP2207028-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.36**	**17.9**	**1.73**	**0.06**	**0.07**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.11**	**13.8**	**1.54**	**0.06**	**0.07**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.36**	**17.0**	**1.64**	**0.06**	**0.07**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**99.7**	**93.2**	**101**	**93.1**
13C8-PFOA	----	0.02	%		**97.7**	**100**	**101**	**95.3**	**96.3**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW243_220609	0089_MW240_220609	0089_MW238_220609	0089_MW239_220609	0089_MW269_220609
				Sampling date / time	09-Jun-2022 10:21	09-Jun-2022 10:56	09-Jun-2022 10:57	09-Jun-2022 10:58	09-Jun-2022 11:22
					EP2207028-006	EP2207028-007	EP2207028-008	EP2207028-009	EP2207028-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**285**	**252**	**208**	**230**	**419**
Total Alkalinity as CaCO3	----	1	mg/L		**285**	**252**	**208**	**230**	**419**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**47**	**60**	**75**	**50**	**103**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**76**	**68**	**39**	**32**	**303**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**123**	**131**	**89**	**91**	**76**
Magnesium	7439-95-4	1	mg/L		**20**	**16**	**18**	**16**	**67**
Sodium	7440-23-5	1	mg/L		**42**	**36**	**26**	**24**	**186**
Potassium	7440-09-7	1	mg/L		**5**	**4**	**4**	**3**	**16**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**8.82**	**8.20**	**6.82**	**6.54**	**19.1**
ø Total Cations	----	0.01	meq/L		**9.74**	**9.52**	**7.16**	**6.98**	**17.8**
ø Ionic Balance	----	0.01	%		**4.97**	**7.44**	**2.42**	**3.25**	**3.41**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.05**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.24**	<0.02	<0.02	**0.09**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.03**	**4.46**	**0.02**	**0.02**	**0.61**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.07**	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.24**	<0.01	<0.01	<0.01	**0.43**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.02**	<0.02	<0.02	**0.02**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.20**	<0.02	<0.02	**0.11**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.05**	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_220609	0089_MW240_220609	0089_MW238_220609	0089_MW239_220609	0089_MW269_220609
				Sampling date / time	09-Jun-2022 10:21	09-Jun-2022 10:56	09-Jun-2022 10:57	09-Jun-2022 10:58	09-Jun-2022 11:22
Compound	CAS Number	LOR	Unit		EP2207028-006	EP2207028-007	EP2207028-008	EP2207028-009	EP2207028-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.09**	<0.01	<0.01	**0.01**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_220609	0089_MW240_220609	0089_MW238_220609	0089_MW239_220609	0089_MW269_220609
				Sampling date / time	09-Jun-2022 10:21	09-Jun-2022 10:56	09-Jun-2022 10:57	09-Jun-2022 10:58	09-Jun-2022 11:22
Compound	CAS Number	LOR	Unit		EP2207028-006	EP2207028-007	EP2207028-008	EP2207028-009	EP2207028-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.27**	**5.13**	**0.02**	**0.02**	**1.32**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.27**	**4.46**	**0.02**	**0.02**	**1.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.27**	**4.82**	**0.02**	**0.02**	**1.23**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**104**	**101**	**97.9**	**93.0**
13C8-PFOA	----	0.02	%		**101**	**103**	**99.9**	**98.6**	**99.8**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW268_220609	----	----	----	----
				Sampling date / time	09-Jun-2022 11:37	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2207028-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**463**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**463**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**726**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**3010**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**214**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**285**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**1680**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**103**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**109**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**110**	----	----	----	----
ø Ionic Balance	----	0.01	%		**0.26**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.05**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.07**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.41**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.05**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW268_220609	----	----	----	----
				Sampling date / time	09-Jun-2022 11:37	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2207028-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW268_220609	----	----	----	----
				Sampling date / time	09-Jun-2022 11:37	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2207028-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.58**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.41**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.51**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.6**	----	----	----	----
13C8-PFOA	----	0.02	%		**103**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2207028**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38740	Issue Date	: 21-Jun-2022
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4405565)									
EP2206971-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	271	272	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	271	272	0.5	0% - 20%
EP2207007-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	165	164	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	165	164	0.8	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4405568)									
EP2207028-006	0089_MW243_220609	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	285	286	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	285	286	0.0	0% - 20%
EP2207044-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	93	93	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	93	93	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4396047)									
EP2206973-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2850	2840	0.5	0% - 20%
EP2207028-004	0089_MW257_220609	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	14	14	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 4396046)									
EP2206973-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19100	19100	0.1	0% - 20%
EP2207028-004	0089_MW257_220609	ED045G: Chloride	16887-00-6	1	mg/L	19	20	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4395471)									
EP2207028-001	0089_MW259_220609	ED093F: Calcium	7440-70-2	1	mg/L	57	59	2.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	14	15	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EP2207028-011	0089_MW268_220609	ED093F: Calcium	7440-70-2	1	mg/L	214	214	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	285	285	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1680	1670	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	103	102	1.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4403328)									
EP2206971-008	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.98	3.08	3.3	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2207028-002	0089_MW256_220609	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	3.12	3.69	16.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	10.7	12.1	12.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.51	0.53	3.7	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.44	0.48	9.9	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.39	0.39	0.0	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4403328)									
EP2206971-008	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2207028-002	0089_MW256_220609	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.42	0.46	9.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.40	0.40	0.0	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.32	1.40	6.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.16	0.17	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.03	0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4403328) - continued									
EP2207028-002	0089_MW256_220609	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	0.3	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4403328)									
EP2206971-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2207028-002	0089_MW256_220609	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	0.08	0.09	16.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4403328)									
EP2206971-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4403328) - continued									
EP2207028-002	0089_MW256_220609	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.16	0.21	31.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4403328)									
EP2206971-008	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	3.05	3.15	3.2	0% - 20%
EP2207028-002	0089_MW256_220609	EP231X: Sum of PFAS	----	0.01	µg/L	17.9	20.2	12.1	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4405565)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	97.8	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4405568)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	105	81.2	126
				<1	200 mg/L	98.3	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396047)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	87.7	113
				<1	500 mg/L	101	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4396046)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	87.9	114
				<1	1000 mg/L	99.2	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4395471)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.3	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.5	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403328)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	119	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	118	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	121	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403328)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	96.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403328) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	120	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	118	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	116	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	126	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403328)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	134	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	117	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	108	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	136	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	100	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403328)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	136	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	134	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	126	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396047)							
EP2206973-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4396046)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 4396046) - continued							
EP2206973-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403328)							
EP2207028-001	0089_MW259_220609	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	106	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	109	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	116	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	102	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	130	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	124	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403328)							
EP2207028-001	0089_MW259_220609	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.8	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	128	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	121	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	119	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	114	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	117	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	118	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	120	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	116	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	109	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403328)							
EP2207028-001	0089_MW259_220609	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	123	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	93.8	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	98.4	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	98.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	123	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403328)							
EP2207028-001	0089_MW259_220609	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	99.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	95.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	111	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403328) - continued							
EP2207028-001	0089_MW259_220609	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	143	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2207028**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling GW - MB	Issue Date	: 21-Jun-2022
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206973--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206973--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW259_220609, 0089_MW256_220609, 0089_MW255_220609, 0089_MW257_220609, 0089_MW245_220609, 0089_MW243_220609, 0089_MW240_220609, 0089_MW238_220609, 0089_MW239_220609, 0089_MW269_220609, 0089_MW268_220609	**09-Jun-2022**	**----**	----	----	**17-Jun-2022**	23-Jun-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW259_220609, 0089_MW256_220609, 0089_MW255_220609, 0089_MW257_220609, 0089_MW245_220609, 0089_MW243_220609, 0089_MW240_220609, 0089_MW238_220609, 0089_MW239_220609, 0089_MW269_220609, 0089_MW268_220609	**09-Jun-2022**	**----**	----	----	**20-Jun-2022**	07-Jul-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW259_220609, 0089_MW256_220609, 0089_MW255_220609, 0089_MW257_220609, 0089_MW245_220609, 0089_MW243_220609, 0089_MW240_220609, 0089_MW238_220609, 0089_MW239_220609, 0089_MW269_220609, 0089_MW268_220609	**09-Jun-2022**	**----**	----	----	**20-Jun-2022**	07-Jul-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW259_220609, 0089_MW256_220609, 0089_MW255_220609, 0089_MW257_220609, 0089_MW245_220609, 0089_MW243_220609, 0089_MW240_220609, 0089_MW238_220609, 0089_MW239_220609, 0089_MW269_220609, 0089_MW268_220609	**09-Jun-2022**	**----**	----	----	**13-Jun-2022**	16-Jun-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW259_220609, 0089_MW256_220609, 0089_MW255_220609, 0089_MW257_220609, 0089_MW245_220609, 0089_MW243_220609, 0089_MW240_220609, 0089_MW238_220609, 0089_MW239_220609, 0089_MW269_220609, 0089_MW268_220609	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW259_220609, 0089_MW256_220609, 0089_MW255_220609, 0089_MW257_220609, 0089_MW245_220609, 0089_MW243_220609, 0089_MW240_220609, 0089_MW238_220609, 0089_MW239_220609, 0089_MW269_220609, 0089_MW268_220609	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW259_220609, 0089_MW256_220609, 0089_MW255_220609, 0089_MW257_220609, 0089_MW245_220609, 0089_MW243_220609, 0089_MW240_220609, 0089_MW238_220609, 0089_MW239_220609, 0089_MW269_220609, 0089_MW268_220609	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW259_220609, 0089_MW256_220609, 0089_MW255_220609, 0089_MW257_220609, 0089_MW245_220609, 0089_MW243_220609, 0089_MW240_220609, 0089_MW238_220609, 0089_MW239_220609, 0089_MW269_220609, 0089_MW268_220609	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW259_220609, 0089_MW256_220609, 0089_MW255_220609, 0089_MW257_220609, 0089_MW245_220609, 0089_MW243_220609, 0089_MW240_220609, 0089_MW238_220609, 0089_MW239_220609, 0089_MW269_220609, 0089_MW268_220609	**09-Jun-2022**	**17-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 38741 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS / **ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW317		09/06/2022 11:52 AM	Water	ALS: 5 Non ALS: 0	No		Partial 4/8		extra PFAS bottles for lab QC
002	0089_PW378		09/06/2022 11:53 AM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
003	0089_SW319		09/06/2022 12:26 PM	Water	ALS: 3 Non ALS: 0	No		Partial 4/8		
004	0089_SW318		09/06/2022 12:26 PM	Water	ALS: 3 Non ALS: 0	No		Partial 3/8		
005	0089_PW375		09/06/2022 12:27 PM	Water	ALS: 4 Non ALS: 0	No		Partial 4/8		use extra 2 large PFAS bottles instead of green bottle
006	0089_PW374		09/06/2022 12:28 PM	Water	ALS: 4 Non ALS: 0	No		Partial 4/8		use extra 2 large PFAS bottles instead of green bottle
007	0089_QC301		09/06/2022 12:35 PM	Water	ALS: 2 Non ALS: 0	No	X			
008	0089_QC302		09/06/2022 12:36 PM	Water	ALS: 2 Non ALS: 0	No	X			
009	0089_QC401		09/06/2022 12:36 PM	Water	ALS: 1 Non ALS: 1	No	X			

CHAIN OF CUSTODY

COC#: 38741 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC402		09/06/2022 12:38 PM	Water	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: **38741** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW317	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW378	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW319	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW318	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW375	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW374	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 38741 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW317	Clear Plastic Bottle - Natural	500 mL	00071121102283	Green	No	
001	0089_SW317	HDPE (no PTFE)	20 mL	00350621067939	Grey	No	
001	0089_SW317	HDPE (no PTFE)	20 mL	00350621067821	Grey	No	
001	0089_SW317	HDPE (no PTFE)	20 mL	00350621068000	Grey	No	
001	0089_SW317	HDPE (no PTFE)	20 mL	00350621067420	Grey	No	
002	0089_PW378	Clear Plastic Bottle - Natural	500 mL	00071121102226	Green	No	
002	0089_PW378	HDPE (no PTFE)	20 mL	00350621067688	Grey	No	
002	0089_PW378	HDPE (no PTFE)	20 mL	00350621067737	Grey	No	
003	0089_SW319	Clear Plastic Bottle - Natural	500 mL	00071121102352	Green	No	
003	0089_SW319	HDPE (no PTFE)	20 mL	00350621067719	Grey	No	
003	0089_SW319	HDPE (no PTFE)	20 mL	00350621067562	Grey	No	
004	0089_SW318	Clear Plastic Bottle - Natural	500 mL	00071121102410	Green	No	
004	0089_SW318	HDPE (no PTFE)	20 mL	00350621068001	Grey	No	
004	0089_SW318	HDPE (no PTFE)	20 mL	00350719049080	Grey	No	
005	0089_PW375	HDPE (no PTFE)	20 mL	00352106001838	Grey	No	
005	0089_PW375	HDPE (no PTFE)	20 mL	00351018002964	Grey	No	
005	0089_PW375	HDPE (no PTFE)	20 mL	00352106001940	Grey	No	
005	0089_PW375	HDPE (no PTFE)	20 mL	00350719049058	Grey	No	
006	0089_PW374	HDPE (no PTFE)	20 mL	00350719049279	Grey	No	
006	0089_PW374	HDPE (no PTFE)	20 mL	00352106001980	Grey	No	
006	0089_PW374	HDPE (no PTFE)	20 mL	00350719048943	Grey	No	
006	0089_PW374	HDPE (no PTFE)	20 mL	00352106001961	Grey	No	
007	0089_QC301	HDPE (no PTFE)	20 mL	00352106000916	Grey	No	
007	0089_QC301	HDPE (no PTFE)	20 mL	00352106000830	Grey	No	
008	0089_QC302	HDPE (no PTFE)	20 mL	00350121020100	Grey	No	
008	0089_QC302	HDPE (no PTFE)	20 mL	00350121020202	Grey	No	

CHAIN OF CUSTODY

COC#: 38741 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_QC401	HDPE (no PTFE)	20 mL	00352106001836	Grey	No	
010	0089_QC402	HDPE (no PTFE)	20 mL	00352106001951	Grey	No	
010	0089_QC402	HDPE (no PTFE)	20 mL	00352106002096	Grey	No	

Total Bottle Count: ALS: 29, Non ALS: 1

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2207029**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 38741	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Jun-2022 16:40	Issue Date	: 13-Jun-2022
Client Requested Due Date	: 22-Jun-2022	Scheduled Reporting Date	: **22-Jun-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2207029-001	09-Jun-2022 11:52	0089_SW317_220609	✓	✓	✓	✓
EP2207029-002	09-Jun-2022 11:53	0089_PW378_220609	✓	✓	✓	✓
EP2207029-003	09-Jun-2022 12:26	0089_SW319_220609	✓	✓	✓	✓
EP2207029-004	09-Jun-2022 12:26	0089_SW318_220609	✓	✓	✓	✓
EP2207029-005	09-Jun-2022 12:27	0089_PW375_220609	✓	✓	✓	✓
EP2207029-006	09-Jun-2022 12:28	0089_PW374_220609	✓	✓	✓	✓
EP2207029-007	09-Jun-2022 12:35	0089_QC301_220609		✓		
EP2207029-008	09-Jun-2022 12:36	0089_QC302_220609		✓		
EP2207029-009	09-Jun-2022 12:36	0089_QC401_220609		✓		
EP2207029-010	09-Jun-2022 12:38	0089_QC402_220609		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]
- EDI Format - ESDAT (ESDAT) Email [redacted]
- EDI Format - XTab (XTAB) Email [redacted]

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2207029**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 16:40
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38741	Issue Date	: 20-Jun-2022 17:09
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220609	0089_QC302_220609	0089_QC401_220609	0089_QC402_220609	----
				Sampling date / time	09-Jun-2022 12:35	09-Jun-2022 12:36	09-Jun-2022 12:36	09-Jun-2022 12:38	----
Compound	CAS Number	LOR	Unit		EP2207029-007	EP2207029-008	EP2207029-009	EP2207029-010	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220609	0089_QC302_220609	0089_QC401_220609	0089_QC402_220609	----
				Sampling date / time	09-Jun-2022 12:35	09-Jun-2022 12:36	09-Jun-2022 12:36	09-Jun-2022 12:38	----
Compound	CAS Number	LOR	Unit		EP2207029-007	EP2207029-008	EP2207029-009	EP2207029-010	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**83.6**	**86.4**	**89.3**	**84.5**	----
13C8-PFOA	----	0.02	%		**108**	**104**	**105**	**106**	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW317_220609	0089_PW378_220609	0089_SW319_220609	0089_SW318_220609	----
				Sampling date / time	09-Jun-2022 11:52	09-Jun-2022 11:53	09-Jun-2022 12:26	09-Jun-2022 12:26	----
Compound	CAS Number	LOR	Unit		EP2207029-001	EP2207029-002	EP2207029-003	EP2207029-004	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		123	122	122	124	----
Total Alkalinity as CaCO3	----	1	mg/L		123	122	122	124	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2530	2480	2720	2500	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17700	17600	17900	17500	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		484	447	453	459	----
Magnesium	7439-95-4	1	mg/L		1580	1450	1480	1490	----
Sodium	7440-23-5	1	mg/L		11500	10600	10700	10900	----
Potassium	7440-09-7	1	mg/L		635	581	593	599	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		554	550	564	548	----
ø Total Cations	----	0.01	meq/L		671	618	625	635	----
ø Ionic Balance	----	0.01	%		9.49	5.74	5.13	7.34	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW317_220609	0089_PW378_220609	0089_SW319_220609	0089_SW318_220609	----
				Sampling date / time	09-Jun-2022 11:52	09-Jun-2022 11:53	09-Jun-2022 12:26	09-Jun-2022 12:26	----
Compound	CAS Number	LOR	Unit		EP2207029-001	EP2207029-002	EP2207029-003	EP2207029-004	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW317_220609	0089_PW378_220609	0089_SW319_220609	0089_SW318_220609	----
			Sampling date / time	09-Jun-2022 11:52	09-Jun-2022 11:53	09-Jun-2022 12:26	09-Jun-2022 12:26	----
Compound	CAS Number	LOR	Unit	EP2207029-001	EP2207029-002	EP2207029-003	EP2207029-004	--------
				Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**87.1**	**89.7**	**83.4**	**87.5**	----
13C8-PFOA	----	0.02	%	**111**	**111**	**114**	**111**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	0089_PW375_220609	0089_PW374_220609	----	----	----
			Sampling date / time	09-Jun-2022 12:27	09-Jun-2022 12:28	----	----	----
Compound	CAS Number	LOR	Unit	EP2207029-005	EP2207029-006	--------	--------	--------
				Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	122	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	122	122	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2480	2460	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	20300	16800	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	456	455	----	----	----
Magnesium	7439-95-4	1	mg/L	1480	1480	----	----	----
Sodium	7440-23-5	1	mg/L	10800	10800	----	----	----
Potassium	7440-09-7	1	mg/L	593	595	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	627	528	----	----	----
ø Total Cations	----	0.01	meq/L	630	630	----	----	----
ø Ionic Balance	----	0.01	%	0.22	8.81	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW375_220609	0089_PW374_220609	----	----	----
				Sampling date / time	09-Jun-2022 12:27	09-Jun-2022 12:28	----	----	----
Compound	CAS Number	LOR	Unit		EP2207029-005	EP2207029-006	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW375_220609	0089_PW374_220609	----	----	----
				Sampling date / time	09-Jun-2022 12:27	09-Jun-2022 12:28	----	----	----
Compound	CAS Number	LOR	Unit		EP2207029-005	EP2207029-006	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.9**	**85.2**	----	----	----
13C8-PFOA	----	0.02	%		**111**	**110**	----	----	----

Surrogate Control Limits

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2207029**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Jun-2022
C-O-C number	: 38741	Issue Date	: 20-Jun-2022
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4405568)									
EP2207028-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	285	286	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	285	286	0.0	0% - 20%
EP2207044-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	93	93	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	93	93	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4396045)									
EP2206970-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2770	2510	9.9	0% - 20%
EP2206971-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	42	42	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4396044)									
EP2206970-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17500	17500	0.0	0% - 20%
EP2206971-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	50	51	2.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4395471)									
EP2207028-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	57	59	2.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	14	15	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EP2207028-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	214	214	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	285	285	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1680	1670	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	103	102	1.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4403725)									
EP2206973-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	0.10	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2207029-010	0089_QC402_220609	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4403725)									
EP2206973-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2207029-010	0089_QC402_220609	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4403725)									
EP2206973-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4403725) - continued									
EP2206973-005	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2207029-010	0089_QC402_220609	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4403725)									
EP2206973-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2207029-010	0089_QC402_220609	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4403725)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4403725) - continued									
EP2206973-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.11	0.12	8.7	0% - 50%
EP2207029-010	0089_QC402_220609	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4405568)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	105	81.2	126
				<1	200 mg/L	98.3	90.0	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396045)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	87.7	113
				<1	500 mg/L	100	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4396044)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.1	87.9	114
				<1	1000 mg/L	96.4	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4395471)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.3	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	90.5	89.7	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403725)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	75.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	105	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	103	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	107	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403725)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	75.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	112	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	90.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403725) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403725)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	93.8	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	105	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	118	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403725)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	95.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	81.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	81.0	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4396045)							
EP2206970-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4396044)							
EP2206970-007	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403725)							
EP2207029-006	0089_PW374_220609	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	114	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	99.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	96.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	95.2	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4403725) - continued							
EP2207029-006	0089_PW374_220609	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	110	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4403725)							
EP2207029-006	0089_PW374_220609	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	83.5	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	113	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	119	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	101	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	111	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	115	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	120	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	128	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	126	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4403725)							
EP2207029-006	0089_PW374_220609	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	118	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	108	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	95.8	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	105	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	108	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	122	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	115	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4403725)							
EP2207029-006	0089_PW374_220609	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	86.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	97.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	99.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2207029**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling SW/PW - MB	Issue Date	: 20-Jun-2022
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2206970--007	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2206970--007	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW317_220609,	0089_PW378_220609,	**09-Jun-2022**	**----**	----	----	**17-Jun-2022**	23-Jun-2022	✓
0089_SW319_220609,	0089_SW318_220609,							
0089_PW375_220609,	0089_PW374_220609							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW317_220609,	0089_PW378_220609,	**09-Jun-2022**	**----**	----	----	**17-Jun-2022**	07-Jul-2022	✓
0089_SW319_220609,	0089_SW318_220609,							
0089_PW375_220609,	0089_PW374_220609							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW317_220609,	0089_PW378_220609,	**09-Jun-2022**	**----**	----	----	**17-Jun-2022**	07-Jul-2022	✓
0089_SW319_220609,	0089_SW318_220609,							
0089_PW375_220609,	0089_PW374_220609							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW317_220609,	0089_PW378_220609,	**09-Jun-2022**	**----**	----	----	**13-Jun-2022**	16-Jun-2022	✓
0089_SW319_220609,	0089_SW318_220609,							
0089_PW375_220609,	0089_PW374_220609							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW317_220609, 0089_PW378_220609, 0089_SW319_220609, 0089_SW318_220609, 0089_PW375_220609, 0089_PW374_220609, 0089_QC301_220609, 0089_QC302_220609, 0089_QC401_220609, 0089_QC402_220609	**09-Jun-2022**	**16-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW317_220609, 0089_PW378_220609, 0089_SW319_220609, 0089_SW318_220609, 0089_PW375_220609, 0089_PW374_220609, 0089_QC301_220609, 0089_QC302_220609, 0089_QC401_220609, 0089_QC402_220609	**09-Jun-2022**	**16-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW317_220609, 0089_PW378_220609, 0089_SW319_220609, 0089_SW318_220609, 0089_PW375_220609, 0089_PW374_220609, 0089_QC301_220609, 0089_QC302_220609, 0089_QC401_220609, 0089_QC402_220609	**09-Jun-2022**	**16-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW317_220609, 0089_PW378_220609, 0089_SW319_220609, 0089_SW318_220609, 0089_PW375_220609, 0089_PW374_220609, 0089_QC301_220609, 0089_QC302_220609, 0089_QC401_220609, 0089_QC402_220609	**09-Jun-2022**	**16-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW317_220609, 0089_PW378_220609, 0089_SW319_220609, 0089_SW318_220609, 0089_PW375_220609, 0089_PW374_220609, 0089_QC301_220609, 0089_QC302_220609, 0089_QC401_220609, 0089_QC402_220609	**09-Jun-2022**	**16-Jun-2022**	06-Dec-2022	✓	**17-Jun-2022**	06-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2208241**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jul-2022
C-O-C number	: ----	Issue Date	: 11-Jul-2022 13:33
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- This workorder is a rebatch of EP2206970.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW357_220608	0089_SW152_220608	----	----	----
				Sampling date / time	08-Jun-2022 13:15	08-Jun-2022 12:54	----	----	----
Compound	CAS Number	LOR	Unit		EP2208241-001	EP2208241-002	--------	--------	--------
					Result	Result	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	**441**	----	----	----
Magnesium	7439-95-4	1	mg/L		----	**1330**	----	----	----
Sodium	7440-23-5	1	mg/L		----	**9490**	----	----	----
Potassium	7440-09-7	1	mg/L		----	**492**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW357_220608	0089_SW152_220608	----	----	----
				Sampling date / time	08-Jun-2022 13:15	08-Jun-2022 12:54	----	----	----
Compound	CAS Number	LOR	Unit		EP2208241-001	EP2208241-002	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.9**	----	----	----	----
13C8-PFOA	----	0.02	%		**99.4**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

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Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name : Maelle Bourdais	Purchase Order : pfasomp	COC Number : pfasomp -01
Office Address : 11 Harvest Terrace, West perth, WA, 6005		PROJECT Number : WA_0089_PFASOMP	Eurofins | mgt quote ID :
	Email for COC/SRN/Results : [redacted]	PROJECT Name : DEF19009/Stirling	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to [redacted] with the project No in the header file

Please send invoice to
[redacted]

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC201_220607	7/06/2022	Water	X
2	0089_QC202_220607	7/06/2022	soil	X
3	0089_QC203_220607	7/06/2022	Water	X
4	0089_QC204_220607	7/06/2022	Water	X
5	0089_QC205_220607	7/06/2022	Water	X
6	0089_QC206_220607	7/06/2022	soil	X
7	0089_QC207_220607	7/06/2022	Water	X
8	0089_QC208_220607	7/06/2022	Water	X
9	0089_QC209_220607	7/06/2022	water	X
10	0089_QC210_220607	7/06/2022	water	X
11	0089_QC211_220607	7/06/2022	water	X
12	0089_QC212_220607	7/06/2022	water	X
13	0089_QC213_220607	7/06/2022	soil	X
14	0089_QC214_220607	7/06/2022	soil	X
15	0089_QC215_220607	7/06/2022	water	X
16	0089_QC216_220607	7/06/2022	water	X
17	0089_QC217_220608	8/06/2022	water	X
18	0089_QC218_220608	8/06/2022	water	X

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar		Sample comments:

Laboratory Staff

Relinquished By: Stantec Australia
Date & Time : 8/06/2022
Signature:

Received By: [redacted]
Date & Time : 9/6/22 4:30pm
Signature: [redacted]

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 17.4

Report number: 896805

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IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	[redacted]
Project name:	DEF19009/Stirling
Project ID:	WA_0089_PFASOMP
Turnaround time:	7 Day
Date/Time received	Jun 9, 2022 4:30 PM
Eurofins reference	896805

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

ATTENTION: Three soil extra soil samples were received, "S0405" "S0407" "QC114". They have been added onto the end of the job and allocated the same analysis.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]

Results will be delivered electronically via email to [redacted] - [redacted] stantec.com.

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: pfasomp
Report #: 896805
Phone: 0458 839 200
Fax:

Received: Jun 9, 2022 4:30 PM
Due: Jun 20, 2022
Priority: 7 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	0089_QC201_220607	Jun 07, 2022		Water	L22-Jn0026430		X	
2	0089_QC202_220607	Jun 07, 2022		Soil	L22-Jn0026431	X		X
3	0089_QC203_220607	Jun 07, 2022		Water	L22-Jn0026432		X	
4	0089_QC204_220607	Jun 07, 2022		Water	L22-Jn0026433		X	
5	0089_QC205_220607	Jun 07, 2022		Water	L22-Jn0026434		X	
6	0089_QC206_	Jun 07, 2022		Soil	L22-	X		X

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IANZ # 1290

Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: pfasomp
Report #: 896805
Phone: 0458 839 200
Fax:

Received: Jun 9, 2022 4:30 PM
Due: Jun 20, 2022
Priority: 7 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
	220607				Jn0026435			
7	0089_QC207_220607	Jun 07, 2022		Water	L22-Jn0026436		X	
8	0089_QC208_220607	Jun 07, 2022		Water	L22-Jn0026437		X	
9	0089_QC209_220607	Jun 07, 2022		Water	L22-Jn0026438		X	
10	0089_QC210_220607	Jun 07, 2022		Water	L22-Jn0026439		X	
11	0089_QC211_220607	Jun 07, 2022		Water	L22-Jn0026440		X	
12	0089_QC212_220607	Jun 07, 2022		Water	L22-Jn0026441		X	

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: pfasomp
Report #: 896805
Phone: 0458 839 200
Fax:

Received: Jun 9, 2022 4:30 PM
Due: Jun 20, 2022
Priority: 7 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
13	0089_QC213_220607	Jun 07, 2022		Soil	L22-Jn0026442	X		X
14	0089_QC214_220607	Jun 07, 2022		Soil	L22-Jn0026443	X		X
15	0089_QC215_220607	Jun 07, 2022		Water	L22-Jn0026444		X	
16	0089_QC216_220607	Jun 07, 2022		Water	L22-Jn0026445		X	
17	0089_QC217_220608	Jun 08, 2022		Water	L22-Jn0026446		X	
18	0089_QC218_220608	Jun 08, 2022		Water	L22-Jn0026447		X	
19	S0405	Jun 07, 2022		Soil	L22-	X		X

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Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
					Jn0026448			
20	S0407	Jun 07, 2022		Soil	L22-Jn0026449	X		X
21	QC114	Jun 07, 2022		Soil	L22-Jn0026450	X		X
Test Counts						7	14	7

Stantec Australia Pty Limited
6F 226,Adelaide Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **896805-S**
Project name DEF19009/Stirling
Project ID WA_0089_PFASOMP
Received Date Jun 09, 2022

Client Sample ID			**0089_QC202_220607**	**0089_QC206_220607**	**0089_QC213_220607**	**0089_QC214_220607**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-Jn0026431**	**L22-Jn0026435**	**L22-Jn0026442**	**L22-Jn0026443**
Date Sampled			**Jun 07, 2022**	**Jun 07, 2022**	**Jun 07, 2022**	**Jun 07, 2022**
Test/Reference	LOR	Unit				
% Moisture	1	%	19	23	25	30
PFAS (Full Suite) Soil						
Perfluorobutanoic acid (PFBA)	0.0008	mg/kg	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Perfluoropentanoic acid (PFPeA)	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Perfluorohexanoic acid (PFHxA)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Perfluoroheptanoic acid (PFHpA)	0.0008	mg/kg	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Perfluorooctanoic acid (PFOA)	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Perfluorononanoic acid (PFNA)	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Perfluorodecanoic acid (PFDA)	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Perfluoroundecanoic acid (PFUnDA)	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Perfluorododecanoic acid (PFDoDA)	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Perfluorotridecanoic acid (PFTrDA)	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Perfluorotetradecanoic acid (PFTeDA)	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Perfluorobutane sulfonic acid (PFBS)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Perfluoropentane sulfonic acid (PFPeS)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Perfluorohexane sulfonic acid (PFHxS)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Perfluoroheptane sulfonic acid (PFHpS)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Perfluorooctane sulfonic acid (PFOS)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Perfluorodecane sulfonic acid (PFDS)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.0005	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.0005	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.0005	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	0.0005	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Perfluorooctane sulfonamide (FOSA)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
N-Methyl perfluorooctane sulfonamide (Me-FOSA)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
N-Ethyl perfluorooctane sulfonamide (Et-FOSA)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Perfluorooctane sulfonamidoacetic acid (FOSAA)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)	0.0008	mg/kg	< 0.0008	< 0.0008	< 0.0008	< 0.0008
N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)	0.0008	mg/kg	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Sum of PFAS	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002

Client Sample ID			0089_QC202_220607	0089_QC206_220607	0089_QC213_220607	0089_QC214_220607
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-Jn0026431**	**L22-Jn0026435**	**L22-Jn0026442**	**L22-Jn0026443**
Date Sampled			**Jun 07, 2022**	**Jun 07, 2022**	**Jun 07, 2022**	**Jun 07, 2022**
Test/Reference	LOR	Unit				
PFAS (Full Suite) Soil						
Sum of PFHxS and PFOS	0.0004	mg/kg	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Sum of PFAS (WA DER List)	0.0002	mg/kg	< 0.0002	< 0.0002	< 0.0002	< 0.0002

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Welshpool	Jun 12, 2022	14 Days
- Method: ARL135 Moisture in Solids			
PFAS (Full Suite) Soil	Welshpool	Jun 12, 2022	28 Days
- Method: ARL511 - Per and Polyfluoroalkyl Substances in Soil/Sediment by LCMS			

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Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	0089_QC201_220607	Jun 07, 2022		Water	L22-Jn0026430		X	
2	0089_QC202_220607	Jun 07, 2022		Soil	L22-Jn0026431	X		X
3	0089_QC203_220607	Jun 07, 2022		Water	L22-Jn0026432		X	
4	0089_QC204_220607	Jun 07, 2022		Water	L22-Jn0026433		X	
5	0089_QC205_220607	Jun 07, 2022		Water	L22-Jn0026434		X	
6	0089_QC206_	Jun 07, 2022		Soil	L22-	X		X

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Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
	220607				Jn0026435			
7	0089_QC207_220607	Jun 07, 2022		Water	L22-Jn0026436		X	
8	0089_QC208_220607	Jun 07, 2022		Water	L22-Jn0026437		X	
9	0089_QC209_220607	Jun 07, 2022		Water	L22-Jn0026438		X	
10	0089_QC210_220607	Jun 07, 2022		Water	L22-Jn0026439		X	
11	0089_QC211_220607	Jun 07, 2022		Water	L22-Jn0026440		X	
12	0089_QC212_220607	Jun 07, 2022		Water	L22-Jn0026441		X	

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External Laboratory								
13	0089_QC213_220607	Jun 07, 2022		Soil	L22-Jn0026442	X		X
14	0089_QC214_220607	Jun 07, 2022		Soil	L22-Jn0026443	X		X
15	0089_QC215_220607	Jun 07, 2022		Water	L22-Jn0026444		X	
16	0089_QC216_220607	Jun 07, 2022		Water	L22-Jn0026445		X	
17	0089_QC217_220608	Jun 08, 2022		Water	L22-Jn0026446		X	
18	0089_QC218_220608	Jun 08, 2022		Water	L22-Jn0026447		X	
19	S0405	Jun 07, 2022		Soil	L22-	X		X

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External Laboratory								
					Jn0026448			
20	S0407	Jun 07, 2022		Soil	L22-Jn0026449	X		X
21	QC114	Jun 07, 2022		Soil	L22-Jn0026450	X		X
Test Counts						7	14	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
PFAS (Full Suite) Soil							
Perfluorobutanoic acid (PFBA)	mg/kg	< 0.0008			0.0008	Pass	
Perfluoropentanoic acid (PFPeA)	mg/kg	< 0.0002			0.0002	Pass	
Perfluorohexanoic acid (PFHxA)	mg/kg	< 0.0004			0.0004	Pass	
Perfluoroheptanoic acid (PFHpA)	mg/kg	< 0.0008			0.0008	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.0002			0.0002	Pass	
Perfluorononanoic acid (PFNA)	mg/kg	< 0.0002			0.0002	Pass	
Perfluorodecanoic acid (PFDA)	mg/kg	< 0.0002			0.0002	Pass	
Perfluoroundecanoic acid (PFUnDA)	mg/kg	< 0.0002			0.0002	Pass	
Perfluorododecanoic acid (PFDoDA)	mg/kg	< 0.0002			0.0002	Pass	
Perfluorotridecanoic acid (PFTrDA)	mg/kg	< 0.0002			0.0002	Pass	
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	< 0.0002			0.0002	Pass	
Perfluorobutane sulfonic acid (PFBS)	mg/kg	< 0.0004			0.0004	Pass	
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	< 0.0004			0.0004	Pass	
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	< 0.0004			0.0004	Pass	
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	< 0.0004			0.0004	Pass	
Perfluorooctane sulfonic acid (PFOS)	mg/kg	< 0.0004			0.0004	Pass	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	< 0.0004			0.0004	Pass	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	< 0.0005			0.0005	Pass	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	< 0.0005			0.0005	Pass	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	< 0.0005			0.0005	Pass	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	< 0.0005			0.0005	Pass	
Perfluorooctane sulfonamide (FOSA)	mg/kg	< 0.0004			0.0004	Pass	
N-Methyl perfluorooctane sulfonamide (Me-FOSA)	mg/kg	< 0.0004			0.0004	Pass	
N-Ethyl perfluorooctane sulfonamide (Et-FOSA)	mg/kg	< 0.0004			0.0004	Pass	
Perfluorooctane sulfonamidoacetic acid (FOSAA)	mg/kg	< 0.0004			0.0004	Pass	
N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA)	mg/kg	< 0.0004			0.0004	Pass	
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)	mg/kg	< 0.0004			0.0004	Pass	
N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)	mg/kg	< 0.0008			0.0008	Pass	
N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)	mg/kg	< 0.0008			0.0008	Pass	
Sum of PFAS	mg/kg	< 0.0002			0.0002	Pass	
Sum of PFHxS and PFOS	mg/kg	< 0.0004			0.0004	Pass	
Sum of PFAS (WA DER List)	mg/kg	< 0.0002			0.0002	Pass	
LCS - % Recovery							
PFAS (Full Suite) Soil							
Perfluorobutanoic acid (PFBA)	%	98			50-130	Pass	
Perfluoropentanoic acid (PFPeA)	%	109			50-130	Pass	
Perfluorohexanoic acid (PFHxA)	%	103			50-130	Pass	
Perfluoroheptanoic acid (PFHpA)	%	109			50-130	Pass	
Perfluorooctanoic acid (PFOA)	%	107			50-130	Pass	
Perfluorononanoic acid (PFNA)	%	102			50-130	Pass	
Perfluorodecanoic acid (PFDA)	%	96			50-130	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	88			50-130	Pass	
Perfluorododecanoic acid (PFDoDA)	%	88			50-130	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	89			50-130	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	83			50-130	Pass	
Perfluorobutane sulfonic acid (PFBS)	%	116			50-130	Pass	
Perfluoropentane sulfonic acid (PFPeS)	%	100			50-130	Pass	
Perfluorohexane sulfonic acid (PFHxS)	%	105			50-130	Pass	
Perfluoroheptane sulfonic acid (PFHpS)	%	113			50-130	Pass	
Perfluorooctane sulfonic acid (PFOS)	%	114			50-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorodecane sulfonic acid (PFDS)			%	111			50-130	Pass	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)			%	105			50-130	Pass	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)			%	112			50-130	Pass	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)			%	115			50-130	Pass	
Perfluorooctane sulfonamide (FOSA)			%	106			50-130	Pass	
N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA)			%	86			50-130	Pass	
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)			%	107			50-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
PFAS (Full Suite) Soil				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-Jn0026435	CP	mg/kg	< 0.0008	< 0.0008	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-Jn0026435	CP	mg/kg	< 0.0008	< 0.0008	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Perfluorobutane sulfonic acid (PFBS)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
Perfluoropentane sulfonic acid (PFPeS)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
Perfluorohexane sulfonic acid (PFHxS)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
Perfluoroheptane sulfonic acid (PFHpS)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
Perfluorooctane sulfonic acid (PFOS)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
Perfluorodecane sulfonic acid (PFDS)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	L22-Jn0026435	CP	mg/kg	< 0.0005	< 0.0005	<1	30%	Pass	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	L22-Jn0026435	CP	mg/kg	< 0.0005	< 0.0005	<1	30%	Pass	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	L22-Jn0026435	CP	mg/kg	< 0.0005	< 0.0005	<1	30%	Pass	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	L22-Jn0026435	CP	mg/kg	< 0.0005	< 0.0005	<1	30%	Pass	
Perfluorooctane sulfonamide (FOSA)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
N-Methyl perfluorooctane sulfonamide (Me-FOSA)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
N-Ethyl perfluorooctane sulfonamide (Et-FOSA)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
Perfluorooctane sulfonamidoacetic acid (FOSAA)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)	L22-Jn0026435	CP	mg/kg	< 0.0008	< 0.0008	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
PFAS (Full Suite) Soil				Result 1	Result 2	RPD			
N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)	L22-Jn0026435	CP	mg/kg	< 0.0008	< 0.0008	<1	30%	Pass	
Sum of PFAS	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Sum of PFHxS and PFOS	L22-Jn0026435	CP	mg/kg	< 0.0004	< 0.0004	<1	30%	Pass	
Sum of PFAS (WA DER List)	L22-Jn0026435	CP	mg/kg	< 0.0002	< 0.0002	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L22-Jn0026443	CP	%	30	30	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

[redacted]	Analytical Services Manager
[redacted]	Senior Analyst-PFAS
Sean Sangster	Senior Analyst-Sample Properties



[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Attention: [redacted]

Report **896805-W**
Project name DEF19009/Stirling
Project ID WA_0089_PFASOMP
Received Date Jun 09, 2022

Client Sample ID			**0089_QC201_220607**	**0089_QC203_220607**	**0089_QC204_220607**	**0089_QC205_220607**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-Jn0026430**	**L22-Jn0026432**	**L22-Jn0026433**	**L22-Jn0026434**
Date Sampled			**Jun 07, 2022**	**Jun 07, 2022**	**Jun 07, 2022**	**Jun 07, 2022**
Test/Reference	LOR	Unit				
PFAS (Full Suite) Water Low						
Perfluorobutanoic acid (PFBA)	0.008	ug/L	0.047	< 0.008	< 0.008	0.045
Perfluoropentanoic acid (PFPeA)	0.002	ug/L	0.087	< 0.002	< 0.002	0.098
Perfluorohexanoic acid (PFHxA)	0.001	ug/L	0.41	< 0.001	< 0.001	0.68
Perfluoroheptanoic acid (PFHpA)	0.004	ug/L	0.070	< 0.004	< 0.004	0.19
Perfluorooctanoic acid (PFOA)	0.001	ug/L	0.16	< 0.001	< 0.001	1.1
Perfluorononanoic acid (PFNA)	0.002	ug/L	< 0.002	< 0.002	< 0.002	0.071
Perfluorodecanoic acid (PFDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	0.006
Perfluoroundecanoic acid (PFUnDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotetradecanoic acid (PFTeDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorobutane sulfonic acid (PFBS)	0.002	ug/L	0.046	< 0.002	< 0.002	0.027
Perfluoropentane sulfonic acid (PFPeS)	0.002	ug/L	0.11	< 0.002	< 0.002	0.15
Perfluorohexane sulfonic acid (PFHxS)	0.002	ug/L	4.4	< 0.002	< 0.002	3.0
Perfluoroheptane sulfonic acid (PFHpS)	0.002	ug/L	0.17	< 0.002	< 0.002	0.73
Perfluorooctane sulfonic acid (PFOS)	0.004	ug/L	0.45	0.004	< 0.004	6.7
Perfluorodecane sulfonic acid (PFDS)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.008	ug/L	< 0.008	< 0.008	< 0.008	0.087
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.002	ug/L	< 0.002	< 0.002	< 0.002	0.013
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
Perfluorooctane sulfonamide (FOSA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	0.46
N-Methyl perfluorooctane sulfonamide (Me-FOSA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Ethyl perfluorooctane sulfonamide (Et-FOSA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
Perfluorooctane sulfonamidoacetic acid (FOSAA)	0.002	ug/L	< 0.002	< 0.002	< 0.002	0.006
N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
Sum of PFAS	0.001	ug/L	6.0	0.004	< 0.001	47
Sum of PFHxS and PFOS	0.002	ug/L	4.9	0.004	< 0.002	43
Sum of PFAS (WA DER List)	0.001	ug/L	5.7	0.004	< 0.001	45

Client Sample ID			0089_QC207_220607	0089_QC208_220607	0089_QC209_220607	0089_QC210_220607
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Jn0026436	L22-Jn0026437	L22-Jn0026438	L22-Jn0026439
Date Sampled			Jun 07, 2022	Jun 07, 2022	Jun 07, 2022	Jun 07, 2022
Test/Reference	LOR	Unit				
PFAS (Full Suite) Water Low						
Perfluorobutanoic acid (PFBA)	0.008	ug/L	0.085	< 0.008	< 0.008	< 0.008
Perfluoropentanoic acid (PFPeA)	0.002	ug/L	0.12	< 0.002	< 0.002	< 0.002
Perfluorohexanoic acid (PFHxA)	0.001	ug/L	0.63	0.002	< 0.001	< 0.001
Perfluoroheptanoic acid (PFHpA)	0.004	ug/L	0.078	< 0.004	< 0.004	< 0.004
Perfluorooctanoic acid (PFOA)	0.001	ug/L	0.22	< 0.001	< 0.001	0.001
Perfluorononanoic acid (PFNA)	0.002	ug/L	< 0.002	< 0.002	< 0.002	< 0.002
Perfluorodecanoic acid (PFDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoroundecanoic acid (PFUnDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotetradecanoic acid (PFTeDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorobutane sulfonic acid (PFBS)	0.002	ug/L	0.14	< 0.002	< 0.002	< 0.002
Perfluoropentane sulfonic acid (PFPeS)	0.002	ug/L	0.29	< 0.002	< 0.002	< 0.002
Perfluorohexane sulfonic acid (PFHxS)	0.002	ug/L	4.0	0.003	< 0.002	0.003
Perfluoroheptane sulfonic acid (PFHpS)	0.002	ug/L	0.38	< 0.002	< 0.002	< 0.002
Perfluorooctane sulfonic acid (PFOS)	0.004	ug/L	2.3	0.027	0.005	0.028
Perfluorodecane sulfonic acid (PFDS)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.008	ug/L	0.010	< 0.008	< 0.008	< 0.008
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.002	ug/L	< 0.002	< 0.002	< 0.002	< 0.002
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
Perfluorooctane sulfonamide (FOSA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Methyl perfluorooctane sulfonamide (Me-FOSA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Ethyl perfluorooctane sulfonamide (Et-FOSA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
Perfluorooctane sulfonamidoacetic acid (FOSAA)	0.002	ug/L	< 0.002	< 0.002	< 0.002	< 0.002
N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
Sum of PFAS	0.001	ug/L	8.2	0.033	0.005	0.033
Sum of PFHxS and PFOS	0.002	ug/L	6.3	0.031	0.005	0.031
Sum of PFAS (WA DER List)	0.001	ug/L	7.6	0.033	0.005	0.033

Client Sample ID			0089_QC211_220607	0089_QC212_220607	0089_QC215_220607	0089_QC216_220607
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Jn0026440	L22-Jn0026441	L22-Jn0026444	L22-Jn0026445
Date Sampled			Jun 07, 2022	Jun 07, 2022	Jun 07, 2022	Jun 07, 2022
Test/Reference	LOR	Unit				
PFAS (Full Suite) Water Low						
Perfluorobutanoic acid (PFBA)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
Perfluoropentanoic acid (PFPeA)	0.002	ug/L	< 0.002	< 0.002	< 0.002	< 0.002
Perfluorohexanoic acid (PFHxA)	0.001	ug/L	0.002	< 0.001	< 0.001	< 0.001
Perfluoroheptanoic acid (PFHpA)	0.004	ug/L	< 0.004	< 0.004	0.036	< 0.004
Perfluorooctanoic acid (PFOA)	0.001	ug/L	0.012	< 0.001	< 0.001	< 0.001

Client Sample ID			0089_QC211_220607	0089_QC212_220607	0089_QC215_220607	0089_QC216_220607
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Jn0026440	L22-Jn0026441	L22-Jn0026444	L22-Jn0026445
Date Sampled			Jun 07, 2022	Jun 07, 2022	Jun 07, 2022	Jun 07, 2022
Test/Reference	LOR	Unit				
PFAS (Full Suite) Water Low						
Perfluorononanoic acid (PFNA)	0.002	ug/L	< 0.002	< 0.002	< 0.002	< 0.002
Perfluorodecanoic acid (PFDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoroundecanoic acid (PFUnDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotetradecanoic acid (PFTeDA)	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorobutane sulfonic acid (PFBS)	0.002	ug/L	< 0.002	< 0.002	0.009	< 0.002
Perfluoropentane sulfonic acid (PFPeS)	0.002	ug/L	0.002	< 0.002	0.007	< 0.002
Perfluorohexane sulfonic acid (PFHxS)	0.002	ug/L	0.013	< 0.002	0.026	< 0.002
Perfluoroheptane sulfonic acid (PFHpS)	0.002	ug/L	< 0.002	< 0.002	< 0.002	< 0.002
Perfluorooctane sulfonic acid (PFOS)	0.004	ug/L	0.006	< 0.004	< 0.004	< 0.004
Perfluorodecane sulfonic acid (PFDS)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.002	ug/L	< 0.002	< 0.002	< 0.002	< 0.002
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
Perfluorooctane sulfonamide (FOSA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Methyl perfluorooctane sulfonamide (Me-FOSA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Ethyl perfluorooctane sulfonamide (Et-FOSA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
Perfluorooctane sulfonamidoacetic acid (FOSAA)	0.002	ug/L	< 0.002	< 0.002	< 0.002	< 0.002
N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)	0.004	ug/L	< 0.004	< 0.004	< 0.004	< 0.004
N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)	0.008	ug/L	< 0.008	< 0.008	< 0.008	< 0.008
Sum of PFAS	0.001	ug/L	0.035	< 0.001	0.078	< 0.001
Sum of PFHxS and PFOS	0.002	ug/L	0.019	< 0.002	0.026	< 0.002
Sum of PFAS (WA DER List)	0.001	ug/L	0.033	< 0.001	0.071	< 0.001

Client Sample ID			0089_QC217_220608	0089_QC218_220608
Sample Matrix			Water	Water
Eurofins Sample No.			L22-Jn0026446	L22-Jn0026447
Date Sampled			Jun 08, 2022	Jun 08, 2022
Test/Reference	LOR	Unit		
PFAS (Full Suite) Water Low				
Perfluorobutanoic acid (PFBA)	0.008	ug/L	< 0.008	< 0.008
Perfluoropentanoic acid (PFPeA)	0.002	ug/L	< 0.002	< 0.002
Perfluorohexanoic acid (PFHxA)	0.001	ug/L	< 0.001	< 0.001
Perfluoroheptanoic acid (PFHpA)	0.004	ug/L	< 0.004	< 0.004
Perfluorooctanoic acid (PFOA)	0.001	ug/L	< 0.001	< 0.001
Perfluorononanoic acid (PFNA)	0.002	ug/L	< 0.002	< 0.002
Perfluorodecanoic acid (PFDA)	0.001	ug/L	< 0.001	< 0.001
Perfluoroundecanoic acid (PFUnDA)	0.001	ug/L	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)	0.001	ug/L	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)	0.001	ug/L	< 0.001	< 0.001

Client Sample ID			0089_QC217_220608	0089_QC218_220608
Sample Matrix			Water	Water
Eurofins Sample No.			L22-Jn0026446	L22-Jn0026447
Date Sampled			Jun 08, 2022	Jun 08, 2022
Test/Reference	LOR	Unit		
PFAS (Full Suite) Water Low				
Perfluorotetradecanoic acid (PFTeDA)	0.001	ug/L	< 0.001	< 0.001
Perfluorobutane sulfonic acid (PFBS)	0.002	ug/L	< 0.002	< 0.002
Perfluoropentane sulfonic acid (PFPeS)	0.002	ug/L	< 0.002	< 0.002
Perfluorohexane sulfonic acid (PFHxS)	0.002	ug/L	< 0.002	< 0.002
Perfluoroheptane sulfonic acid (PFHpS)	0.002	ug/L	< 0.002	< 0.002
Perfluorooctane sulfonic acid (PFOS)	0.004	ug/L	< 0.004	0.006
Perfluorodecane sulfonic acid (PFDS)	0.004	ug/L	< 0.004	< 0.004
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0.008	ug/L	< 0.008	< 0.008
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.008	ug/L	< 0.008	< 0.008
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.002	ug/L	< 0.002	< 0.002
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	0.004	ug/L	< 0.004	< 0.004
Perfluorooctane sulfonamide (FOSA)	0.004	ug/L	< 0.004	< 0.004
N-Methyl perfluorooctane sulfonamide (Me-FOSA)	0.004	ug/L	< 0.004	< 0.004
N-Ethyl perfluorooctane sulfonamide (Et-FOSA)	0.004	ug/L	< 0.004	< 0.004
Perfluorooctane sulfonamidoacetic acid (FOSAA)	0.002	ug/L	< 0.002	< 0.002
N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)	0.004	ug/L	< 0.004	< 0.004
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)	0.004	ug/L	< 0.004	< 0.004
N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)	0.008	ug/L	< 0.008	< 0.008
N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)	0.008	ug/L	< 0.008	< 0.008
Sum of PFAS	0.001	ug/L	< 0.001	0.006
Sum of PFHxS and PFOS	0.002	ug/L	< 0.002	0.006
Sum of PFAS (WA DER List)	0.001	ug/L	< 0.001	0.006

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
PFAS (Full Suite) Water Low	Welshpool	Jun 13, 2022	28 Days

- Method: ARL510 - Per and Polyfluoroalkyl Substances in Water by LCMS

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Project Name: DEF19009/Stirling
Project ID: WA_0089_PFASOMP

Order No.: pfasomp
Report #: 896805
Phone: 0458 839 200
Fax:

Received: Jun 9, 2022 4:30 PM
Due: Jun 20, 2022
Priority: 7 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	0089_QC201_220607	Jun 07, 2022		Water	L22-Jn0026430		X	
2	0089_QC202_220607	Jun 07, 2022		Soil	L22-Jn0026431	X		X
3	0089_QC203_220607	Jun 07, 2022		Water	L22-Jn0026432		X	
4	0089_QC204_220607	Jun 07, 2022		Water	L22-Jn0026433		X	
5	0089_QC205_220607	Jun 07, 2022		Water	L22-Jn0026434		X	
6	0089_QC206_	Jun 07, 2022		Soil	L22-	X		X

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Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
	220607				Jn0026435			
7	0089_QC207_220607	Jun 07, 2022		Water	L22-Jn0026436		X	
8	0089_QC208_220607	Jun 07, 2022		Water	L22-Jn0026437		X	
9	0089_QC209_220607	Jun 07, 2022		Water	L22-Jn0026438		X	
10	0089_QC210_220607	Jun 07, 2022		Water	L22-Jn0026439		X	
11	0089_QC211_220607	Jun 07, 2022		Water	L22-Jn0026440		X	
12	0089_QC212_220607	Jun 07, 2022		Water	L22-Jn0026441		X	

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Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
13	0089_QC213_220607	Jun 07, 2022		Soil	L22-Jn0026442	X		X
14	0089_QC214_220607	Jun 07, 2022		Soil	L22-Jn0026443	X		X
15	0089_QC215_220607	Jun 07, 2022		Water	L22-Jn0026444		X	
16	0089_QC216_220607	Jun 07, 2022		Water	L22-Jn0026445		X	
17	0089_QC217_220608	Jun 08, 2022		Water	L22-Jn0026446		X	
18	0089_QC218_220608	Jun 08, 2022		Water	L22-Jn0026447		X	
19	S0405	Jun 07, 2022		Soil	L22-	X		X

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Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217								
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
External Laboratory								
					Jn0026448			
20	S0407	Jun 07, 2022		Soil	L22-Jn0026449	X		X
21	QC114	Jun 07, 2022		Soil	L22-Jn0026450	X		X
Test Counts						7	14	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
PFAS (Full Suite) Water Low							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.008			0.008	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.002			0.002	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.004			0.004	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.001			0.001	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.002			0.002	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.001			0.001	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.001			0.001	Pass	
Perfluorobutane sulfonic acid (PFBS)	ug/L	< 0.002			0.002	Pass	
Perfluoropentane sulfonic acid (PFPeS)	ug/L	< 0.002			0.002	Pass	
Perfluorohexane sulfonic acid (PFHxS)	ug/L	< 0.002			0.002	Pass	
Perfluoroheptane sulfonic acid (PFHpS)	ug/L	< 0.002			0.002	Pass	
Perfluorooctane sulfonic acid (PFOS)	ug/L	< 0.004			0.004	Pass	
Perfluorodecane sulfonic acid (PFDS)	ug/L	< 0.004			0.004	Pass	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ug/L	< 0.008			0.008	Pass	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ug/L	< 0.008			0.008	Pass	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ug/L	< 0.002			0.002	Pass	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ug/L	< 0.004			0.004	Pass	
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.004			0.004	Pass	
N-Methyl perfluorooctane sulfonamide (Me-FOSA)	ug/L	< 0.004			0.004	Pass	
N-Ethyl perfluorooctane sulfonamide (Et-FOSA)	ug/L	< 0.004			0.004	Pass	
Perfluorooctane sulfonamidoacetic acid (FOSAA)	ug/L	< 0.002			0.002	Pass	
N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)	ug/L	< 0.004			0.004	Pass	
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)	ug/L	< 0.004			0.004	Pass	
N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)	ug/L	< 0.008			0.008	Pass	
N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)	ug/L	< 0.008			0.008	Pass	
Sum of PFAS	ug/L	< 0.001			0.001	Pass	
Sum of PFHxS and PFOS	ug/L	< 0.002			0.002	Pass	
Sum of PFAS (WA DER List)	ug/L	< 0.001			0.001	Pass	
LCS - % Recovery							
PFAS (Full Suite) Water Low							
Perfluorobutanoic acid (PFBA)	%	103			50-130	Pass	
Perfluoropentanoic acid (PFPeA)	%	89			50-130	Pass	
Perfluorohexanoic acid (PFHxA)	%	111			50-130	Pass	
Perfluoroheptanoic acid (PFHpA)	%	113			50-130	Pass	
Perfluorooctanoic acid (PFOA)	%	88			50-130	Pass	
Perfluorononanoic acid (PFNA)	%	86			50-130	Pass	
Perfluorodecanoic acid (PFDA)	%	106			50-130	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	92			50-130	Pass	
Perfluorododecanoic acid (PFDoDA)	%	89			50-130	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	85			50-130	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	97			50-130	Pass	
Perfluorobutane sulfonic acid (PFBS)	%	114			50-130	Pass	
Perfluoropentane sulfonic acid (PFPeS)	%	99			50-130	Pass	
Perfluorohexane sulfonic acid (PFHxS)	%	96			50-130	Pass	
Perfluoroheptane sulfonic acid (PFHpS)	%	101			50-130	Pass	
Perfluorooctane sulfonic acid (PFOS)	%	107			50-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorodecane sulfonic acid (PFDS)	%	101			50-130	Pass	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	%	116			50-130	Pass	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	%	106			50-130	Pass	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	%	109			50-130	Pass	
Perfluorooctane sulfonamide (FOSA)	%	104			50-130	Pass	
N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)	%	112			50-130	Pass	
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)	%	113			50-130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS



[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2208241**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jul-2022
C-O-C number	: ----	Issue Date	: 11-Jul-2022
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4438397)									
EP2208215-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	12	11	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EP2208279-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	16	17	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 4438397)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.3	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.9	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	109	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4441735)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	117	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	126	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	122	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	109	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	107	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441735)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	116	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	126	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	129	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	125	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	121	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	130	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	128	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	124	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	123	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441735)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	127	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	134	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	115	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	144	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	122	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	116	65.0	136

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441735) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441735)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	113	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	129	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	136	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	133	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2208241**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Jun-2022
Site	: Stirling SW/PW - MB	Issue Date	: 11-Jul-2022
Sampler	: [redacted]	No. of samples received	: 2
Order number	: pfas-omp/Stirling	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_SW152_220608	----	----	----	05-Jul-2022	15-Jun-2022	**20**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW152_220608	**08-Jun-2022**	**----**	----	----	**05-Jul-2022**	15-Jun-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW357_220608	**08-Jun-2022**	**06-Jul-2022**	05-Dec-2022	✓	**06-Jul-2022**	05-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW357_220608	**08-Jun-2022**	**06-Jul-2022**	05-Dec-2022	✓	**06-Jul-2022**	05-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW357_220608	**08-Jun-2022**	**06-Jul-2022**	05-Dec-2022	✓	**06-Jul-2022**	05-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW357_220608	**08-Jun-2022**	**06-Jul-2022**	05-Dec-2022	✓	**06-Jul-2022**	05-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW357_220608	**08-Jun-2022**	**06-Jul-2022**	05-Dec-2022	✓	**06-Jul-2022**	05-Dec-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Major Cations - Dissolved	ED093F	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Major Cations - Dissolved	ED093F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Major Cations - Dissolved	ED093F	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

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Stantec

Monitoring Date	Monitoring Location	Sample_ID	Screen Interval	TOC (mAHD)	Well Depth (m)	SWL Time	SWL (mbTOC)	RWL (mAHD)	Other Observations on Bore/Site	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Reading Comments	QC Dup Sample #	Odour	Colour
8/06/2022	MW010		NA	4.859	9.2	14:21			Pvc casing snapped at GL. unable to sample.											
7/06/2022	MW109	0089_MW109_220607	2.5-5.5_	4.446	5.5	09:11	3.99	0.456		Hydrasleeve	18	1.31	936	611	7.42	-172.2		107/207	Slight H2S	Cloudy
7/06/2022	MW112	0089_MW112_220607	3.0 - 6.0	3.973	6	08:47	3.385	0.588		Hydrasleeve	19.8	1.23	485.5	315.9	7.64	119.2		Qc105/205		Clear
7/06/2022	MW120	0089_MW120_220607	2.5-5.5_	4.409	5.5	09:01	3.955	0.454		Hydrasleeve	19.7	1.29	632	409.5	7.52	110.1				Clear
7/06/2022	MW121	0089_MW121_220607	2.7-5.7_	3.7	5.7	08:20	3.235	0.465	Hydrasleeve didn't fill up during recovery	HandBailing	19	5.15	763	494	7.72	68.3		101/201		Cloudy
7/06/2022	MW123	0089_MW123_220607	4.5-8_	6.62	8	07:58	6.18	0.44		Hydrasleeve	17.7	0.44	1971	1280.5	7.4	-133.5				Clear
7/06/2022	MW124	0089_MW124_220607	0.75-4_	1.899	4	11:14	1.625	0.274		Hydrasleeve	18.4	0.69	20665	13442	7.33	-186.7				Clear
7/06/2022	MW125	0089_MW125_220607	0.9-3.9_	1.882	3.9	10:30	1.63	0.252		Hydrasleeve	18.9	0.77	44803	29146	7.27	-245.8				Clear
7/06/2022	MW126	0089_MW126_220607	0.9-3.9_	1.948	3.9	10:20	1.71	0.238		Hydrasleeve	18.8	1.11	41941	27287	7.09	-250			H2S	Clear
7/06/2022	MW127	0089_MW127_220607	0.9-3.9_	1.771	3.9	09:39	1.51	0.261		Hydrasleeve	19.9	0.53	37448	24401	6.94	-251.1				Clear
7/06/2022	MW128	0089_MW128_220607	2.5-5.5_	4.537	5.5	15:19	4.31	0.227	Unblocked	Hydrasleeve	17.6	0.38			7.28	-193.4	EC probe not working no ec and tds recorded			Brown,Cloudy
8/06/2022	MW137		0.9-3.9_	2.058	3.9	10:29			Not found	Hydrasleeve										
8/06/2022	MW139	0089_MW139_220608	2-5_	2.273	5	08:57	1.89	0.383		Hydrasleeve	19.1	1.23	5386	3503.5	7.64	70.5				Clear
8/06/2022	MW141	0089_MW141_220608	2-5_	3.025	5	09:12	2.66	0.365		Hydrasleeve	18.9	1.37	33277	21664	7	-219.5				Clear
8/06/2022	MW142	0089_MW142_220608	0.25-4_	2.573	4	10:29	2.22	0.353		Hydrasleeve	19.7	0.56	30614	19896.5	7.29	-142.5				Clear
8/06/2022	MW147		2-5_	3.423	5.2	09:19			Dry/blocked at 2.96m											
8/06/2022	MW149	0089_MW149_220608	1-4_	2.303	4	10:44	1.91	0.393		Hydrasleeve	18.1	2.07	44848	29152.5	7.72	-162.3				Clear
7/06/2022	MW158	0089_MW158_220607	NA	14.541	15.8	19:11	13.908	0.633		Hydrasleeve	20.4	8.25	13181	9387	7.16	-92.6				
7/06/2022	MW161	0089_MW161_220607	NA	17.225	18.13	19:09	16.637	0.588		Hydrasleeve	20.4	8.31	3175	2261	7.29	-1.4				
7/06/2022	MW166	0089_MW166_220607	10.0-13.0_	11.89	13.0	19:08	11.193	0.697		Hydrasleeve	19.2	8.84	3170	2312	7.34	-67.6				
7/06/2022	MW171	0089_MW171_220607	28.5-31.5_	29.238	31.5	19:07	28.341	0.897		Hydrasleeve	19.9	16.23	12891	9304	7.16	-205.3				
8/06/2022	MW172	0089_MW172_220608	NA	16.772	26	10:20	16.32	0.452		Hydrasleeve	16.9	0.66			7.39	88.1	No EC / TDS reading taken			Brown,Cloudy
8/06/2022	MW173	0089_MW173_220608	NA	10.08	11.11	12:15	9.5	0.58		Hydrasleeve	19.6	1.43	4602	2990	7.31	-164.6				Clear
7/06/2022	MW193	0089_MW193_220607	10.5-13.5_	11.86	13.5	19:05	10.842	0.58		Hydrasleeve	19.3	2.52	4079	2973	7.2	-286.6				
7/06/2022	MW195D	0089_MW195D_220607	10.0-13.0_	4.363	13.0	19:01	3.53	0.58		Hydrasleeve	19.7	11.71	32780	23785	7.28	-76.2				
7/06/2022	MW195S	0089_MW195S_220607	3.5-6.5_	4.571	6.5	19:03	3.487	0.58	QC111/QC211	Hydrasleeve	20.9	17.16	5194	3661	7.21	-15		QC111/QC211		
7/06/2022	MW196	0089_MW196_220607	NA	12.75	13.8	12:17			Dry											
7/06/2022	MW197	0089_MW197_220607	NA	2.28	NA	08:32	2.061	0.219		Hydrasleeve	19.5	6.1	4164	3039	7.23	1.9				
7/06/2022	MW199	0089_MW199_220607	NA	11.8	NA	10:17	10.571	1.229	QC109/209	Hydrasleeve	20	8.77	11349	8153	7.27	42.3		QC109/209		
7/06/2022	MW200	0089_MW200_220607	NA	2.07	NA	09:17	1.879	0.191		Hydrasleeve	20.2	8.39	10280	7341	7.61	57.4				
8/06/2022	MW202	0089_MW202_220608	NA	2.12	NA	13:31	1.72	0.4		Hydrasleeve	18	1.42			7.76	56	No EC / TDS reading taken			Clear
7/06/2022	MW203	0089_MW203_220607	NA	10.855	12.9	12:30	10.41	0.445	Hydrasleeve didn't fill up during recovery	HandBailing	20.6	3.02	995	643.5	7.91	-4.5		115/215		Cloudy
7/06/2022	MW214	0089_MW214_220607	5.5-9_	8.075	9	07:52	7.67	0.405		Hydrasleeve	13.1	1.51	147043*	126685*	7.05	-93.6			Sulfidic	Clear,Black
7/06/2022	MW215	0089_MW215_220607	1.5-4.5_	3.794	4.5	08:29	3.46	0.334		Hydrasleeve	17.2	1.72	103010*	79950*	7.46	-51.5				Clear
7/06/2022	MW216	0089_MW216_220607	6-9_	8.329	6	08:11	7.87	0.459		Hydrasleeve	15.6	1.09	133170*	106080*	7.41	-20.1				Cloudy
8/06/2022	MW217	0089_MW217_220608	6.5-9.5_	8.847	9.5	10:49	8.93	-0.083		Hydrasleeve	17.3	1.43			7.65	79.2				Cloudy
8/06/2022	MW220	0089_MW220_220608	NA	NA	NA	11:50	6.86			Hydrasleeve	18.7	1.21			7.69	109.5	No EC / TDS reading taken			Brown,Cloudy
8/06/2022	MW224	0089_MW224_220608	11.25-14.25_	13.372	14.25	11:32	13.38	-0.008		Hydrasleeve	17.1	1.13			7.73	120	No EC / TDS reading taken			Cloudy
7/06/2022	MW225	0089_MW225_220607	2-5_	4.066	5	11:10	3.75	0.316		Hydrasleeve	18.8	0.86	90490*	72020*	7.43	-216.5		QC112,QC212		Cloudy
7/06/2022	MW226	0089_MW226_220607	0.75-3.8_	1.749	3.8	13:21	1.75	-0.001		Hydrasleeve	19.1	0.75	113072*	78454*	7.16	-99.4				Yellow
7/06/2022	MW227	0089_MW227_220607	1.25-4.2_	2.961	4.2	11:30	2.73	0.231		Hydrasleeve	17.5	0.25	96149*	69354*	7.39	-220.5			Slight sulfidic	Clear
7/06/2022	MW228	0089_MW228_220607	0.75-3.75_	2.23	3.75	12:39	1.92	0.31		Hydrasleeve	19.8	1.6	73403	54925	7.6	-136				Cloudy
8/06/2022	MW233	0089_MW233_220608	NA	3.705	4.968	13:52	3.09	0.615		Hydrasleeve	16.7	2.27	242.6	157.95	7.91	-83				Clear
7/06/2022	MW236	0089_MW236_220607	NA	4.642	5.66	12:56	3.995	0.647	Hydrasleeve didn't fill up during recovery	HandBailing	19.5	3.29	632	409.5	7.71	24.7				Cloudy,Brown
9/06/2022	MW238	0089_MW238_220609	NA	4.827	NA	10:49	4.28	0.547		Hydrasleeve	19.8	1.93	679	442	7.84	-2.5				Cloudy
9/06/2022	MW239	0089_MW239_220609	NA	4.03	NA	10:54	3.5	0.53		Hydrasleeve	19.9	3.61	643	416	7.79	1.3			Slight hydrocarbon	Cloudy
9/06/2022	MW240	0089_MW240_220609	NA	4.483	6.8	10:31	3.935	0.548		Hydrasleeve	20.2	2.34	897	585	7.64				Hydrocarbons	Cloudy
8/06/2022	MW242	0089_MW242_220608	NA	3.539	4.76	15:16	3.03	0.509		Hydrasleeve	22	1.65	518.1	336.7	7.9	-25				Clear
9/06/2022	MW243	0089_MW243_220609	NA	4.892	7	10:18	4.24	0.652		Hydrasleeve	17.9	3.07	908	591.5	7.74	-3.4			Hydrocarbons	Brown,Cloudy
9/06/2022	MW245	0089_MW245_220609	NA	4.551	5.65	09:56	4.042	0.509		Hydrasleeve	18	2.69	876	572	7.28	-101.7			Hydrocarbons	Clear
8/06/2022	MW248		NA	4.073	NA	14:35			Bore casing damaged by earthworks, unable to sample.											
8/06/2022	MW249	0089_MW249_220608	3.5-6.5_	5.227	6.5	15:04	4.795	0.432		Hydrasleeve	21.6	0.77	1239	806	7.49	-149.6				Clear
9/06/2022	MW255	0089_MW255_220609	3-6_	4.609	6	09:19	4.005	0.604		Hydrasleeve	19.6	1.37	816	533	7.74	-70.8				Cloudy
9/06/2022	MW256	0089_MW256_220609	3-6_	3.84	6	09:02	3.225	0.615		Hydrasleeve	18.9	1.19	1261	819	7.25	-179.8				Cloudy
9/06/2022	MW257	0089_MW257_220609	2.7-5.7_	3.806	5.7	09:32	3.235	0.571		Hydrasleeve	19.3	6.22	358.2	358.3	8.08	-18.6				Clear
8/06/2022	MW258	0089_MW258_220608	3-6_	4.043	6	15:01	3.68	0.363	Unblocked	Hydrasleeve	20.5	3.21			7.84	110.5				Cloudy,Brown
9/06/2022	MW259	0089_MW259_220609	2.5-5.5_	3.8	5.5	08:44	3.24	0.56		Hydrasleeve	18	2.64	389.3	252.85	7.91	3.3				Clear
8/06/2022	MW261		3.0-6.0_	3.858	6.0	14:28			Not found. covered in mulch in new vegetated area											
8/06/2022	MW264					14:11			Bore has been destroyed, construction site	Hydrasleeve										
9/06/2022	MW268	0089_MW268_220609	2.5-5.5_	4.056	5.5	11:34	3.624	0.432		Hydrasleeve	20.9	1.06	4018	2613	7.3	-9.2				Clear
9/06/2022	MW269	0089_MW269_220609	2.5-5.5_	4.153	5.5	11:18	3.657	0.496		Hydrasleeve	19	1.52	1715	1118	7.32	-109.9				Clear
8/06/2022	MW272		0.9-3.9_	2.226	3.9	09:31			Not found											
8/06/2022	MW282	0089_MW282_220608	4.5-7.5_	5.78	7.5	10:59	5.65	0.13		Hydrasleeve	17.7				7.15	97.6				Cloudy
8/06/2022	MW288	0089_MW288_220608	2.25-5.25_	4.003	5.25	14:23	3.65	0.353		Hydrasleeve	19.3	1.21			8.06	8.6				Clear
8/06/2022	MW289	0089_MW289_220608	3.25-6.25_	4.495	6.25	13:34	3.964	0.531		Hydrasleeve	21.2	0.55	1206	786.5	7.52	-36.3				Clear
7/06/2022	MW500	0089_MW500_220607	2-6.5_	3.692	6.5	08:36	3.243	0.449		Hydrasleeve	18.5	1.34	880	572	7.36	123.1				Clear
8/06/2022	MW516	0089_MW516_220608	4.5-7.5_	6.37	7.5	14:49	5.985	0.385		Hydrasleeve	20.2	0.73	1229	799.5	7.28	-66.5				Cloudy
9/06/2022	MW517		3-6_	4.77	6	08:30			Lost (new electrical pit installed at location)											
8/06/2022	MW518		3.5-6.5_	5.55	6.5	14:17			Damaged by recent earthworks/blocked at 5mbgl											

Notes: * EC and TDS values erroneous
DO reading in %

Monitoring Date	Monitoring Location	Sample ID	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Reading Comments	QC Dup Sample #	Odour	Colour
8/06/2022	PW304	0089_PW304_220608	Peristaltic Pump	14.9	1.8			7.47	84.8	No EC and TDS readings recorded			Clear
7/06/2022	PW306	0089_PW306_220607	Peristaltic Pump	14.8	0.69	205576*	166075*	7.3	-244.1			Sulfidic	Cloudy,Yellow
7/06/2022	PW307	0089_PW307_220607	Peristaltic Pump	15	2.11	179196*	143390*	8	100.7				Clear
7/06/2022	PW308	0089_PW308_220607	Peristaltic Pump	14.7	3.08	146115*	186250*	7.97	79.1				Clear
7/06/2022	PW314	0089_PW314_220607	Peristaltic Pump	15.8	1.25	209546*	165165*	7.61	85.4				Clear
7/06/2022	PW315	0089_PW315_220607	Peristaltic Pump	15.5	1.38	210504*	166855*	7.7	97.7		QC104,QC204		Clear
7/06/2022	PW316	0089_PW316_220607	Peristaltic Pump	15.3	2.43	152603*	124215*	7.96	88.8				Clear
8/06/2022	PW329	0089_PW329_220608	Peristaltic Pump	16.4	3.49	54744	35581	7.49	4.7				Clear
8/06/2022	PW330	0089_PW330_220608	Peristaltic Pump	14.9	1.54	55396	36010	7.12	-67.8		QC117/217		Clear
8/06/2022	PW331	0089_PW331_220608	Peristaltic Pump	14.9	2.63	55637	36166	7.43	2.3		QC118/218		Clear
7/06/2022	PW335	0089_PW335_220607	Peristaltic Pump	14.4	2.01	54988	35743	7.58	-46.9				Clear
7/06/2022	PW340	0089_PW340_220607	Peristaltic Pump	14.8	1.36	55300	35951	7.52	-86.6				Clear
7/06/2022	PW341	0089_PW341_220607	Peristaltic Pump	14.7	1.47	54044	35132	7.59					Clear
7/06/2022	PW345	0089_PW345_220607	Peristaltic Pump	14.2	12.53	44314	36298	7.72	89.6				Clear
8/06/2022	PW346	0089_PW346_220608	Peristaltic Pump	15.4	0.05			7.5	14.1	No EC and TDS readings recorded			Brown
7/06/2022	PW350	0089_PW350_220607	Peristaltic Pump	17.8	13.69	48194	36302	7.88	8.6				Clear
7/06/2022	PW351	0089_PW351_220607	Peristaltic Pump	17.4	8.56	47550	36165	7.92	42.2				Clear
7/06/2022	PW352	0089_PW352_220607	Peristaltic Pump	17.4	5.09	47701	36262	7.83	-77.8				Clear
8/06/2022	PW356	0089_PW356_220608	Peristaltic Pump	14.7	3.63	54998	35750	7.48	-18.2				Cloudy
8/06/2022	PW357	0089_PW357_220608	Peristaltic Pump	14.5	0.75	55126	35834	7.32	-280.9			Seaweed	Cloudy
8/06/2022	PW358	0089_PW358_220608	Peristaltic Pump	16.5	4.43	54480	35412	7.6	-8.1				Clear
7/06/2022	PW362	0089_PW362_220607	Peristaltic Pump	14.4	1.34	54642	35522	7.52	-108.3		QC110/210		Cloudy
7/06/2022	PW363	0089_PW363_220607	Peristaltic Pump	14.5	5.41	54361	35340	7.9	-42				Clear
7/06/2022	PW364	0089_PW364_220607	Peristaltic Pump	14.6	2.54	54787	35794	7.83	2.1				Clear
7/06/2022	PW367	0089_PW367_220607	Peristaltic Pump	14.5	15.21	41275	33254	7.53	-41.2				Clear
8/06/2022	PW368	0089_PW368_220608	Peristaltic Pump	15.4	0.01			7.48	153	No EC and TDS readings recorded			Clear
7/06/2022	PW369	0089_PW369_220607	Peristaltic Pump	12.9	15.64	40112	33991	7.59	63.8				Clear
9/06/2022	PW374	0089_PW374_220609	Peristaltic Pump	17.4	4.55	53260	35269	7.99	14.2				Clear
9/06/2022	PW375	0089_PW375_220609	Peristaltic Pump	17.3	3.69	53245	34262.5	8.04	12.9				Clear
9/06/2022	PW378	0089_PW378_220609	Peristaltic Pump	16.9	5.43	53317	34658	7.96	20.3				Clear
7/06/2022	PW380	0089_PW380_220607	Peristaltic Pump	15.9	12.07	46611	36535	7.89	37.6				Clear
7/06/2022	PW381	0089_PW381_220607	Peristaltic Pump	17.6	6.31	48013	36373	7.95	52.4				Clear
7/06/2022	PW401	0089_PW401_220607	Peristaltic Pump	18.1	11.61	43560	36350	7.92	26.3				Clear
7/06/2022	PW405	0089_PW405_220607	Peristaltic Pump	13.4	2.37	157939*	30375	7.83	53.6				Brown,Cloudy
7/06/2022	PW407	0089_PW407_220607	Peristaltic Pump	14.8	2.05	163514*	33055	7.67	27.1				Clear
7/06/2022	PW409	0089_PW409_220607	Peristaltic Pump	14.3	4.14	102595*	86255*	7.84	47.2				Clear
7/06/2022	PW411	0089_PW411_220607	Peristaltic Pump	15	4.03	94008*	74685*	7.9	84.2				Clear
7/06/2022	PW413	0089_PW413_220607	Peristaltic Pump	14.8	4.46	88950*	68640*	7.89	64.8				Clear
7/06/2022	PW415	0089_PW415_220607	Peristaltic Pump	15.3	4.12	97273*	74424*	7.93	68.1				Clear

Note: * EC and TDS values erroneous

Monitoring Location	Date	Sample ID	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	Site Comments	Temp °C	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Water Colour	Turbidity	Comments
SW130	7/06/2022	0089_SW130_220607	Direct into Bottle	0.1	1	Seaweed	16.5	5.66	54372	35360	8	-1.4	Cloudy with seaweed	High	
SW132	7/06/2022	0089_SW132_220607	Direct into Bottle	0.1	1	Seaweed	15.9	5.21	54347	35334	7.91	-9.7	Turbid, seaweed	Medium	
SW134	7/06/2022	0089_SW134_220607	Direct into Bottle	0.1	1	Seaweed	14.4	5.38	54465	35405.5	7.98	-9.5	Cloudy	Medium	QC108/208
SW150	8/06/2022	0089_SW150_220608	Direct into Bottle	0.1	0.8	Seaweed	15.1	5.66	54333	35314.5	7.8	22.5	Cloudy with seaweed	Medium	
SW152	8/06/2022	0089_SW152_220608	Direct into Bottle	0.1	0.8	Seaweed	15.1	5.63	54382	35347	7.93	29.7	Cloudy	Medium	
SW154	8/06/2022	0089_SW154_220608	Direct into Bottle	0.1	0.8		15.6	6.15	54362	35334	7.9	-17.6	Cloudy	Medium	
SW156	8/06/2022	0089_SW156_220608	Direct into Bottle	0.1	0.8		15.8	6.12	54287	35288.5	7.9	13.9	Cloudy	Medium	
SW305	8/06/2022	0089_SW305_220608	Direct into Bottle	0.1	1		16.1	3.4			7.9	115.3	Clear		No EC and TDS readings recorded
SW309	7/06/2022	0089_SW309_220607	Direct into Bottle	0.1	1		15.9	1.63			7.96	97.6	Clear		No EC and TDS readings recorded
SW310	7/06/2022	0089_SW310_220607	Direct into Bottle	0.1	1		13.1	2.02			8.04	140.84	Clear		No EC and TDS readings recorded
SW311	7/06/2022	0089_SW311_220607	Direct into Bottle	0.1	1		13.7	1.94			7.87	77.7	Clear		
SW317	9/06/2022	0089_SW317_220609	Direct into Bottle	0.1	1		15.9	5.89	53342	34671	8.01	20.9	Clear	Low	
SW318	9/06/2022	0089_SW318_220609	Direct into Bottle	0.1	1		16.3	6.01	54234	35249	8.13	20.2	Clear		
SW319	9/06/2022	0089_SW319_220609	Direct into Bottle	0.1	1		15.8	6.39	54233	35249	8.1	15.4	Clear	Low	
SW353	7/06/2022	0089_SW353_220607	Direct into Bottle	0.1	1		18.3	15.32	48190	35893	7.83	-3	Clear	Low	
SW370	7/06/2022	0089_SW370_220607	Direct into Bottle	0.1	1		14.1	16.61	42762	35121	7.67	-55.7	Clear		
SW371	8/06/2022	0089_SW371_220608	Direct into Bottle	0.1	1		15.3	3.47			7.8	122.5	Clear		No EC and TDS readings recorded
SW372	8/06/2022	0089_SW372_220608	Direct into Bottle	0.1	1		16.8	2.56			7.82	126.3	Clear		No EC and TDS readings recorded
SW373	8/06/2022	0089_SW373_220608	Direct into Bottle	0.1	1		16.6	3.63			8.01	110.8	Clear		No EC and TDS readings recorded
SW382	7/06/2022	0089_SW382_220607	Direct into Bottle	0.1	1		17.6	6.56	47986	36345	7.95	45.5	Clear	Medium	
SW383	7/06/2022	0089_SW383_220607	Direct into Bottle	0.1	1		18	10.43	48455	36339	7.94	33.6			
SW384	7/06/2022	0089_SW384_220607	Direct into Bottle	0.1	1		17.8	13.4	47984	36189	7.9	16.7			
SW406	7/06/2022	0089_SW406_220607	Direct into Bottle	0.1	1		15.6	2.09	172992*	36890	7.9	43.9	Clear	Medium	
SW408	7/06/2022	0089_SW408_220607	Direct into Bottle	0.1	1		14.9	2.51	188162*	145275*	7.43	-4.5	Clear		
SW410	7/06/2022	0089_SW410_220607	Direct into Bottle	0.1	1		16.8	3.65	103415*	79884*	7.8	3.5	Clear		
SW412	7/06/2022	0089_SW412_220607	Direct into Bottle	0.1	1		15.5	3.96	101886*	79975*	7.99	86.5	Clear		
SW414	7/06/2022	0089_SW414_220607	Direct into Bottle	0.1	1		15.4	4.01	91567*	71370*	7.96	75.4	Clear		QC116,216 Taken
SW416	7/06/2022	0089_SW416_220607	Direct into Bottle	0.1	1		15.8	4.5	95352*	76375*	8.05	61.7	Clear		

Note: * EC and TDS values erroneous

Monitoring Location	Date	Sample ID	Depth of Sampling (m)	Sampling Method	Sample Condition	Sample Description	Comments
SD304	8/06/2022	0089_SD304_220608	0.8	Shovel, Trowel	Wet	Brown sandy no odour	
SD306	7/06/2022	0089_SD306_220607	0.8	Shovel, Trowel	Wet	Grey, sandy suldidic odour present	
SD307	7/06/2022	0089_SD307_220607	0.7	Shovel, Trowel	Wet	Brown sandy no odour	
SD308	7/06/2022	0089_SD308_220607	0.8	Shovel, Trowel	Wet	Brown, sandy, no odour	
SD314	7/06/2022	0089_SD314_220607	0.8	Shovel, Trowel	Wet	Brown sandy no odour	QC102,QC202
SD315	7/06/2022	0089_SD315_220607	0.8	Shovel, Trowel	Wet	Brown sandy no odour	
SD316	7/06/2022	0089_SD316_220607	0.8	Shovel, Trowel	Wet	Brown, sandy, no odour	
SD329	8/06/2022	0089_SD329_220608	0.8	Shovel, Trowel	Wet	Grey sand	
SD330	8/06/2022	0089_SD330_220608	0.8	Shovel, Trowel	Wet	Grey sand	
SD331	8/06/2022	0089_SD331_220608	0.6	Shovel, Trowel	Wet	Grey sand	
SD335	7/06/2022	0089_SD335_220607	0.6	Shovel, Trowel	Wet	Gery sand	QC113/213
SD340	7/06/2022	0089_SD340_220607	0.8	Shovel, Trowel	Wet	Grey sand	
SD341	7/06/2022	0089_SD341_220607	0.8	Shovel, Trowel	Wet	Grey sand	
SD345	7/06/2022	0089_SD345_220607	0.5	Shovel, Trowel	Wet	Grey white	
SD346	8/06/2022	0089_SD346_220608	0.5	Shovel, Trowel	Wet	Brown, sandy seaweed, no odour	
SD350	7/06/2022	0089_SD350_220607	0.8	Shovel, Trowel	Wet	Beige coarse sand	
SD351	7/06/2022	0089_SD351_220607	0.8	Shovel, Trowel	Wet	Beige coarse sand	
SD352	7/06/2022	0089_SD352_220607	0.8	Shovel, Trowel	Wet	Beige coarse sand	
SD356	8/06/2022	0089_SD356_220608	0.6	Shovel, Trowel	Wet	greu sand	
SD357	8/06/2022	0089_SD357_220608	0.6	Shovel, Trowel	Wet	Grey sand	Seaweed
SD358	8/06/2022	0089_SD358_220608	0.8	Shovel, Trowel	Wet	Grey sand	
SD362	7/06/2022	0089_SD362_220607	0.8	Shovel, Trowel	Wet	Grey sand	
SD363	7/06/2022	0089_SD363_220607	0.5	Shovel, Trowel	Wet	Grey sand	
SD364	7/06/2022	0089_SD364_220607	0.7	Shovel, Trowel	Wet	Grey sand	
SD367	7/06/2022	0089_SD367_220607	0.8	Shovel, Trowel	Wet	Grey	
SD368	8/06/2022	0089_SD368_220608	0.8	Shovel, Trowel	Wet	Brown sandy no odour	
SD369	7/06/2022	0089_SD369_220607	0.8	Shovel, Trowel	Wet	Grey white	QC106/206
SD374	9/06/2022	0089_SD374_220609	0.6	Shovel, Trowel	Wet	Sand, beige	
SD375	9/06/2022	0089_SD375_220609	0.6	Shovel, Trowel	Wet	Beige sand	
SD378	9/06/2022	0089_SD378_220609	0.8	Shovel, Trowel	Wet	Grey sand	
SD380	7/06/2022	0089_SD380_220607	0.8	Shovel, Trowel	Wet	Beige coarse sand	
SD381	7/06/2022	0089_SD381_220607	0.8	Shovel, Trowel	Wet	Beige coarse sand	
SD401	7/06/2022	0089_SD401_220607	0.8	Shovel, Trowel	Wet	Beige coarse sand	
SD405	7/06/2022	0089_SD405_220607	0.7	Shovel, Trowel	Wet	Brown sandy no odour	
SD407	7/06/2022	0089_SD407_220607	0.8	Shovel, Trowel	Wet	Brown sandy no odour	QC114,214 Taken
SD409	7/06/2022	0089_SD409_220607	0.6	Shovel, Trowel	Wet	Brown, sandy. No odour	
SD411	7/06/2022	0089_SD411_220607	0.8	Shovel, Trowel	Wet	Brown sandy no odour	
SD413	7/06/2022	0089_SD413_220607	0.8	Shovel, Trowel	Wet	Brown sandy no odour	
SD415	7/06/2022	0089_SD415_220607	0.7	Shovel, Trowel	Wet	Brown sandy no odour	

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 19K102536
Cable length: 1m 18K100836

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	171.90 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.2
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 4 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	17.3	-0.6	°C	NA	16.7	°C
pH (21H)	pH 7.00	375757	7.01	-21.50	mV	6.97	7.01	pH
pH (21H)	pH 4.00	378281	4.00	150.40	mV	3.93	4.00	pH
Conductivity (18K100288)	2764 µs/cm at 25°C	21/1012	2764	GLP	4.85	2755	2764	µs/cm
ORP (20012SEN605102)	Zobell A & B	21/1611	247	247	mV	242.4	242.8	mV
Zero DO (19L100728)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.6	0.0	%
100% DO (19L100728)	100% Air Saturation	Air	100.0	4.45	uA	100.6	100.0	%

Calibrated by: [redacted]

Calibration Date: 31-May-22
Next Due: 27-Nov-22

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Stantec
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20K104050
Cable length: 1m 20K100096

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.10 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.4
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 4 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	17.6	-0.1	°C	NA	17.5	°C
pH (21A)	pH 7.00	375757	7.01	-30.60	mV	7.04	7.01	pH
pH (21A)	pH 4.00	378281	4.00	141.50	mV	4	4.00	pH
Conductivity (20K100397)	2764 µs/cm at 25°C	21/1012	2764	GLP	5.04	2754	2764	µs/cm
ORP (201005SIA605102)	Zobell A & B	21/1611	246	246	mV	240.4	241.8	mV
Zero DO (20H100139)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.3	0.0	%
100% DO (20H100139)	100% Air Saturation	Air	100.0	4.53	uA	102.8	100.0	%

Calibrated by: [redacted]

Calibration Date: 01-Jun-22
Next Due: 28-Nov-22

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Stantec
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 19K102536
Cable length: 1m 18K100836

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	171.90 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.2
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 4 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	17.3	-0.6	°C	NA	16.7	°C
pH (21H)	pH 7.00	375757	7.01	-21.50	mV	6.97	7.01	pH
pH (21H)	pH 4.00	378281	4.00	150.40	mV	3.93	4.00	pH
Conductivity (18K100288)	2764 µs/cm at 25°C	21/1012	2764	GLP	4.85	2755	2764	µs/cm
ORP (20012SEN605102)	Zobell A & B	21/1611	247	247	mV	242.4	242.8	mV
Zero DO (19L100728)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.6	0.0	%
100% DO (19L100728)	100% Air Saturation	Air	100.0	4.45	uA	100.6	100.0	%

Calibrated by: [redacted]

Calibration Date: 31-May-22
Next Due: 27-Nov-22

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
08/06/22	DEF19009 0089	YSI # 19ICL02536	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: ~~1,413µS/cm~~ 12,880 (Y) N	14.0	pH 4.00: 4.17 pH 7.00: 7.07 EC:	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) Y / N	[redacted]		
08/06/22	DEF19009 0089	YSI # 20C [illegible]	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: ~~1,413µS/cm~~ 12,880 (Y) N	14.3	pH 4.00: 4.15 pH 7.00: 7.12 EC: 12615	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) Y (N)			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			

APPENDIX

E

DATA QUALITY REVIEW

Cardno

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Stantec

Data Quality Review
PFAS Ongoing Monitoring Plan
Q2 2022 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 7 and 9 June 2022 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HMAS Stirling, Cardno, March 2022) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling* , NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP Q2 2022 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times were in compliance with required timeframes.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report, and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2206880, EP2206881, EP2206882, EP2206883, EP2206884, EP2206885, EP2206886, EP2206887, EP2206888, EP2206968, EP2206969, EP2206970, EP2206971, EP2206972, EP2206973, EP2207027, EP2207028, EP2207029, EP2208241. ▪ Eurofins report: 896805

<table>
<tr><th>QA/QC Aspects</th><th>Evidence & Evaluation</th></tr>
<tr><td colspan="2">Data Precision & Accuracy</td></tr>
<tr><td>QC sample Frequency</td><td>
<table>
<tr><th>QC sample type</th><th>SAQP required frequency</th><th>Sample Collected</th></tr>
<tr><td>Blind duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 59 groundwater samples (11.9%)
4 for 39 porewater samples (10.3%)
3 in 28 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Interlab duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 59 groundwater samples (11.9%)
4 for 39 porewater samples (10.3%)
3 in 28 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Rinsate</td><td>1 per field crew per day</td><td>7 for 3 day (2/3 field personnel) (100%)</td></tr>
<tr><td>Field Blank</td><td>1 per field crew per day</td><td>7 for 3 day (2/3 field personnel) (100%)</td></tr>
</table>
The required QC frequency was achieved for all sample types.</td></tr>
<tr><td>RPD Acceptance criteria</td><td>
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table></td></tr>
<tr><td>QC Testing – Blind Duplicates (Primary Lab)</td><td>Groundwater
▪ Primary Groundwater Samples Analysed: 59
▪ Blind Duplicate Samples Analysed: 7
All RPDs were within acceptance criteria.
Porewater
▪ Primary porewater Samples Analysed: 39
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria.
Surface water
▪ Primary surface water Samples Analysed: 28
▪ Blind Duplicate Samples Analysed: 3
All RPDs were within acceptance criteria.
Sediment
▪ Primary Sediment Samples Analysed: 39
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria.</td></tr>
<tr><td>QC Testing – Interlab Duplicates (Secondary Lab)</td><td>Groundwater
▪ Primary Groundwater Samples Analysed: 59
▪ Interlab Duplicate Samples Analysed: 7
All RPDs were within acceptance criteria with the following exception:</td></tr>
</table>

QA/QC Aspects	Evidence & Evaluation
	▪ QC211 (Sum of PFAS – 111%) and QC215 (Sum of PFAS – 111%). These exceedances are due the difference of LOR between the primary and secondary laboratories and the low concentrations of analytes under review. Individual analytes didn't report RPD exceedances. This is not considered to have impacted the reliability of the dataset. ▪ QC201 (PFPeS – 37%, PFHpS – 26%, PFOS – 27%, PFPeA – 40%, PFOA 22%). These minor RPDs differences are likely due to the difference or methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. This is not considered to have impacted the reliability of the dataset. ▪ QC205 (PFHxS – 87%, PFHpS – 70%, PFOS – 167%, FOSA – 43%). These RPDs differences are likely due to the difference or methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. In all cases the primary sample reported higher concentrations than the duplicate sample therefore the results reported on are considered conservative. This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ▪ QC207 (PFPeS – 22%, PFHxS – 42%, PFHpS – 31%, PFOS – 67%, PFPeA – 22%, PFHxA – 25%, PFOA – 27%). These minor RPDs differences are likely due to the difference or methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. In all cases, te results were of the same order of magnitude as the the primary sample, which also reported higher concentrations than the duplicate sample. Therefore the results reported on are considered conservative. This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Porewater*** ▪ Primary porewater Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria. ***Surface water*** ▪ Primary surface water Samples Analysed: 28 ▪ Interlab Duplicate Samples Analysed: 3 All RPDs were within acceptance criteria with the exception of QC sample QC208 which reported the following RPD exceedance: ▪ Sum of PFAS (49%) This minor exceedance is due to the difference of LOR between the primary and secondary laboratories and the low concentrations of analytes under review. Individual analytes didn't report RPD exceedances. This is not considered to have impacted the reliability of the dataset. ***Sediment*** ▪ Primary sediment Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria with the exception of QC sample QC206 which reported the following RPD exceedance: ▪ PFOS <0.0004 mg/kg /primary sample: 0.0021 mg/kg (136%) This exceedance is probably due to the difference of laboratory methods. The primary sample reported a higher concentration and therefore the result reported on is considered conservative.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank results were within acceptable range.

QA/QC Aspects	Evidence & Evaluation
	All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2206881, EP2206883, EP2206884, EP2206887, EP2206888, EP2206969, EP2206970, EP2206971, EP2206973, EP2207028 - Samples ID: PW364, PW352, PW314, SW150, PW368, Anonymous: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. The following quality control samples frequency outliers were reported: ▪ EP2206880, EP2206883, EP2206884, EP2206887, EP2206888, EP2206969, EP2206970 - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. ▪ EP2206884, EP2206887, EP2206888, EP2206969 - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria. It was noted that the secondary laboratory applied a limit of reporting one order of magnitude lower than the primary laboratory for PFAS in water. This is not considered to have impacted the reliability of the data collected as part of this monitoring event.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per sampler when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.

PFAS OMP Quarterly Sampling Event Factual Report

September 2022

HMAS Stirling

304700525



Prepared for
Department of Defence

22 December 2022

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluoro-hexane Sulphonate
PFOA	Per-fluoro-octanoic Acid
PFOS	Per-fluoro-octane Sulfonate

Technical Terms

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AS	Australian Standard
BGL	Below Ground Level
CEC	Cation Exchange Capacity
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
EC	Electrical Conductivity
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mAHD	Metres relative to the Australia Heigh Datum
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity – Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTG	Fire Training Ground
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

Cardno was engaged by the Australian Department of Defence ("the Client") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) at HMAS Stirling ("the site"). The site is located on Garden Island, Western Australia.

The OMP was carried out in accordance with the scope and limitations presented in Cardno's Sampling and Analysis Quality Plan (SAQP):

> Cardno, 11 August 2022, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling.* Rev 7.

The SAQP was reviewed prior to the Q3 2022 monitoring event and groundwater monitoring locations identified as destroyed during the Q2 2022 monitoring event were removed.

For the purposes of this report:

> The Management Area was defined as comprising of Garden Island and the marine nearshore environment (Figure 1A, Appendix A).

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF).

The purpose of this PFAS OMP factual report is to provide an up-to-date status of the condition of the site as it is currently understood in relation to the most recent sampling event.

The objectives of the report are:

> To provide a succinct summary of the Q3 2022 sampling event and provision of analytical results with supporting tables and figures.

> To provide confirmation of the current understanding of risk.

> To provide supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

This assessment has been undertaken in general accordance with applicable industry standards for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

> National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended 2013) (ASC NEPM).

> Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan (NEMP) 2.0*.

> Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.

> Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.

> Australian and New Zealand Guidelines, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

> Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[1].

[1] It is noted that the site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-site properties and waterways.

> Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.

> U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.

> USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*

> National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment. The PFAS source areas are shown on Figure 1B, Appendix A.

2.1 Groundwater Monitoring

Sampling of selected groundwater bores was performed in general accordance with the SAQP (Cardno, 2022), applying methods set out in Section 3 of this report. The groundwater bores monitored as part of the OMP are presented in Table 2-1, and are shown on Figures 2A and 2B, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	No.
Demolition Ground	MW139, MW141, MW142, MW147, MW149	5
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	11
Waste water treatment plant	MW158, MW161, MW166, MW171, MW172, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203	15
Accommodation Area	MW288, MW289	2
Dredged Sediments	MW268, MW269	2
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW516, MW249	10
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259, MW261	6
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	11

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2022), applying methods set out in Section 3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3A to 5B, Appendix A.

Table 2-2 Porewater, Surface Water and Sediment Monitoring Locations

Monitoring Area	Porewater Sampling Location ID	No.	Sediment Sampling Location ID	No.	Surface Water Sampling Location ID	No.
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	6	SD329, SD330, SD331, SD356, SD357, SD358	6	SW150, SW152, SW154, SW156	4
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	6	SD335, SD340, SD341, SD362, SD363, SD364	6	SW130, SW132, SW134	3
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	11	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	11	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	9
Accommodation Area	PW346	1	SD346	1		
Dredged Sediments	PW374, PW375, PW378	3	SD374, SD375, SD378	3	SW317, SW318, SW319	3
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	12	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	12	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	9

2.3 Data Management

All the data included in the report has been collected, uploaded and reviewed according to the data management requirements of the *Defence Contamination Management Manual* (DCMM) Annex L (Defence, 2021), including:

- The sample naming convention detailed in the DCMM Annex L was used in the field;
- All field data collected was uploaded to the ESdat database;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q3 2022 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW147	Not sampled	This well was found blocked at 2.5 mBGL during this monitoring event. Medium impact – No data collected for Q3 2022, down-gradient well MW272 was lost (assumed destroyed) and removed from the monitoring program. It was also observed that this bore is within dense overgrown bush and therefore repairs appear difficult. Replacement of the lost/compromised bores at the demolition ground is recommended.
MW261	Not Sampled	Bore not found (covered in mulch in new vegetated patch). Medium impact – Several bores have been lost in this area (and subsequently removed from the SAQP)
MW496	Sampled	Sampled in replacement of nearby damaged well MW248. Replacement location deemed suitable as at proximity (<50m) to the damaged well, and similar screen depth (3.5 – 8.0 mBGL). Positive impact on the OMP – collection of additional PFAS data.
All groundwater monitoring locations	Water quality meter not placed down-hole	The water quality parameters were taken from water collected from the HydraSleeve® rather than placing the water quality meter inside the wells casing to prevent cross-contamination from happening. No impact on the OMP.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was generally undertaken by no purge HydraSleeve® method as detailed in Table 3-1.

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	Standing Water Levels (SWL) were gauged using an interface probe. All wells were measured against a surveyed mark at the top of the well casing. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater field parameters were recorded via a pre-calibrated water quality meter prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded: ▪ pH ▪ electrical conductivity (EC) ▪ oxidation reduction potential (ORP) ▪ Dissolved oxygen (DO) ▪ Temperature Once field parameters were stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve®	HydraSleeve® were deployed with top weight for sample collection to begin at the lowest point. Following Q3 2022 sampling, new HydraSleeve® were deployed in preparation for the next OMP monitoring event scheduled for Q4 2022, using the same string for consistency (same depth of sampling i.e. within screen depth).
Retrieval of HydraSleeve® (Sample Collection)	HydraSleeve® sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. HydraSleeve® used during Q3 2022 were the ones deployed following Q2 2022. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the HydraSleeve®. Purging of the well was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume).
Decontamination procedure	Dedicated HydraSleeve® and HDPE hand bailers (single use and disposable) were used at each groundwater bore thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample was identified with the sample location, date and project identification number. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

Activity	Details
Quality Control	Groundwater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and CoC documentation are included in Appendix C.

3.2 Porewater and Sediment Sampling Methodology

The methodologies for sediment and porewater sampling are detailed in Table 3-2 and Table 3-3 respectively.

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed, and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 20 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 20 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the USEPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.

Item	Detail
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 3-4.

Table 3-4 Surface water Sampling Methodology

Item	Details
Field parameters	The following field parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature Field observations such as odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. The sample container was positioned 10 cm below the surface water level where possible and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples were collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) *Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Surface water QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Surface water samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.4 Quality Control / Quality Assurance

A critical aspect of site assessments is the demonstration of the quality of the data used as the basis for the assessment. This is achieved through a Data Validation process which includes a review of the following data quality indicators, as described in the SAQP:

> QA documentation.

> Bias.

> Data Representativeness.

- Data Precision & Accuracy.
- Laboratory Performance.
- Data Comparability.
- Data Set Completeness.

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E. The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

The adopted assessment criteria for groundwater, porewater and surface water are detailed in Table 3-5.

Table 3-5 Criteria for Groundwater, Porewater and Surface Water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health - Drinking Water Quality Guideline	0.07[1]	0.56	HEPA 2020
Human Health – Recreational Water	2[1]	10	HEPA 2020
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only; The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR), however, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement.

3.5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment will be assessed against the NEMP (HEPA, 2020) soil criteria for consistency with the SAQP (Cardno, 2022), DSI (RPS, 2018b) and ERA (RPS, 2018c). The adopted assessment criteria for sediments are detailed in Table 3-6.

Table 3-6 Criteria for Sediment

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	mg/kg		
Human Health - Commercial / industrial (on-base activities)	20[1]	50	HEPA 2020
Ecological - Direct exposure (interim guidelines)	1[2]	10	HEPA 2020
Ecological - Indirect exposure (interim guidelines) (on site)	0.01[2]	-	HEPA 2020

Notes:

1. Sum of PFOS and PFHxS.
2. PFOS only

4 Field Observations and Results

4.1 General Site Observations

No weather event that could have impacted the sampling or results obtained was observed. The maximum daily temperature during the monitoring event varied between 15.9 and 17.6°C. Earthworks were still ongoing at the main Base area, however, didn't include dewatering or deep excavations works and therefore, are not considered to have affected the results obtained as part of the Q3 2022 monitoring event.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling records, included in Appendix D. Field parameters were generally consistent with previous monitoring events. Groundwater pH ranged from 6.27 (MW288) to 8.66 (MW233) and was slightly acidic to slightly alkaline and water was observed clear to brown in colour. Groundwater temperature ranged from 14.7°C (MW233) to 21.4°C (MW289). DO readings ranged from 0.21mg/L (MW125) to 7.69 mg/L (MW173) which mostly indicate aerobic groundwater condition. EC readings ranged from 357 µS/cm (MW257) to 44,742 µS/cm (MW149) and indicate fresh to highly saline groundwater conditions. There was a sulphur odour noted at several groundwater wells (MW124, MW125, MW126, MW127, MW226, MW256). Hydrocarbon odour was recorded at several wells within fuel storage areas (MW172, MW193, MW236, MW240, MW245) which is consistent with previous event's field records.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Appendix D. The groundwater elevations ranged between 0.217 mAHD (MW195D) and 1.122 mAHD (MW224). It is expected that groundwater levels and flow direction for monitoring well relatively close to the shoreline are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours. Groundwater flow was interpreted to be radial from the site and towards areas of depression following local topography (i.e. groundwater generally flows towards the ocean), which is consistent with previous monitoring events. Groundwater inferred elevation contours and inferred flow direction for the Q3 2022 monitoring event are shown in Figure 6, Appendix A.

4.2.2 Groundwater Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-1. Laboratory results have also been compared to available historical data in order to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figures 2A and 2B in Appendix A presents the groundwater monitoring locations. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW120, MW141, MW172, MW236, MW258, MW282, MW500	0.56[2]	9.32 (MW282)	61	8

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
Sum of PFHxS and PFOS	MW109, MW112, MW120, MW121, MW123, MW125, MW128, MW141, MW142, MW161, MW166, MW171, MW172, MW173, MW193, MW215, MW216, MW217, MW220, MW228, MW236, MW240, MW243, MW245, MW249, MW255, MW256, MW257, MW258, MW259, MW268, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.07[2]	131 (MW141)	61	38
PFOS	MW109, MW112, MW120, MW121, MW123, MW125, MW128, MW141, MW142, MW161, MW166, MW172, MW173, MW193, MW202, MW216, MW217, MW220, MW224, MW233, MW236, MW242, MW243, MW245, MW249, MW255, MW256, MW257, MW258, MW259, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.01[3]	102 (MW141)	61	37

Notes:

1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

- MW496, located at the AVCAT storage and fuel farm, reported new exceedances of the ecological guideline for PFOS (0.00023 µg/L, 6.95 µg/L detected), the recreational use guideline (2.0 µg/L, 8.80 µg/L detected) for the Sum of PFOS and PFHxS. These were also first-time detections of PFOA (0.16 µg/L detected) and Sum of PFOS and PFHxS. It is noted that this monitoring well was sampled for the first time for PFAS during Q3 2022.

4.3 Surface Water

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Surface water pH ranged from 6.45 (SW130) to 8.2 (SW383, SW384, SW406) and was near neutral, temperature was 17°C on average, water was generally clear and EC readings ranging 22,150 (SW408) to 54267 µS/cm (SW152) indicate highly saline conditions. DO readings ranging 2.74 mg/L (SW132) to 7.45 mg/L (SW406) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data. Figures 3A and 3B in Appendix A presents the surface water monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	28	0

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
Sum of PFHxS and PFOS	SW372, SW373	0.07[2]	0.09 (SW373)	28	2
PFOS	SW370, SW372, SW373	0.01[3]	0.08 (SW373)	28	3

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q3 2022.

4.4 Porewater

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling record sheets, included in Appendix D. Parameters were generally consistent with the previous monitoring events. Porewater pH ranging 7.31 (PW346) to 8.19 (PW401) was near neutral, with an average temperature of 16.8°C. Water was generally clear and EC readings ranging 8,335 (PW304) to 56,245 µS/cm (PW330) indicate saline to highly saline porewater conditions. DO readings ranging 0.38 (PW368) to 8.48 mg/L (PW380) mostly indicate aerobic porewater condition. No visual or olfactory evidence of contamination were observed.

4.4.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data. Figures 4A and 4B in Appendix A presents the porewater monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Tabulated results including non-PFAS analytes are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-3 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	39	0
Sum of PFHxS and PFOS	PW346, PW369	0.07[2]	0.15 (PW346)	39	2
PFOS	PW304, PW341, PW346, PW363, PW367, PW369, PW374, PW375, PW378, PW380	0.01[3]	0.11 (PW346, PW369)	39	10

Notes:
1. Non-inclusive of quality control samples
2. HEPA 2020 guideline value for human health – drinking water
3. LOR adopted instead of HEPA (2020) guideline value for ecological – 99% species protection

Findings are summarised as follows:

> No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q3 2022.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D. Sediment samples were generally described as grey wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. Soil criteria are adopted in the absence of criteria for sediment for consistency with the SAQP (Cardno, 2022), DSI (RPS, 2018b) and ERA (RPS, 2018c). A summary of results is presented in Table 4-4. Laboratory results have also been compared to available historical data. Figures 5A and 5B in Appendix A presents the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Table 4-4 Summary of Sediment Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (mg/kg)	Max Conc. (mg/kg)	No. Analytical Results[4]	No. Results Above Criteria
PFOA	-	10[1]	<0.0002	39	0
Sum of PFHxS and PFOS	-	20[3]	0.0025 (SD346)	39	0
PFOS	-	0.01[2]	0.0025 (SD346)	39	0

Notes:

1. Ecosystems – direct exposure
2. Ecological - indirect exposure
3. Human health – comm/industrial
4. Non-inclusive of quality control samples

Findings are summarised as follows:

- SD341 located at the FTA recorded a first-time detection of Sum of PFOS and PFHxS (0.0004 mg/kg detected).
- No new exceedance of guideline values was reported for the sediment monitoring locations in Q3 2022.
- All sediment samples reported PFAS concentrations either below the LOR or at detectable values below the adopted assessment criteria.

4.6 Changes to the Monitoring Network Condition

The following changes to the monitoring network were noted during the Q3 2022 monitoring event:

- MW261 wasn't found (assumed gatic lid was covered by mulch) and wasn't able to be recovered with a metal detector.
- It was noted that further erosion had occurred on the coastline at the demolition ground, and it is likely that other monitoring wells will be compromised in the future.
- At the AVCAT storage area, monitoring well MW239 was recovered from being buried under the side of a large sand stockpile, this well is likely to be damaged (filled up with sand) or lost in the future. Protection of this monitoring location is recommended.

5 Summary and Conclusions

Cardno undertook the 2022 Q3 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Groundwater sampling and testing was undertaken at 61 monitoring bores, 28 surface water locations and 39 sediment and porewater co-located sampling locations. Of the two monitoring wells that could not be sampled, one was blocked, and one was not found.

Groundwater levels were gauged in all wells before sampling. Groundwater flow was interpreted to be radial from the site where mounding of groundwater is occurring (i.e. groundwater follows the site's topography and flows towards the ocean), consistent with the previous monitoring events.

The groundwater laboratory results reported the following:

- Of the 61 samples that were tested, PFOA (8 samples), PFOS (38 samples) and Sum of PFHxS and PFOS (37 samples) reported concentrations that exceeded adopted assessment criteria.
- MW496, located at the AVCAT storage and fuel farm, reported new exceedances of the ecological guideline for PFOS (0.00023 µg/L, 6.95 µg/L detected), the recreational use guideline (2.0 µg/L, 8.80 µg/L detected) for the Sum of PFOS and PFHxS. These were also first-time detections of PFOA (0.16 µg/L detected) and Sum of PFOS and PFHxS. It is noted that this monitoring well was sampled for the first time for PFAS during Q3 2022.

The surface water laboratory results reported the following:

- Of the 28 samples tested, PFOS (3 samples) and Sum of PFHxS and PFOS (2 samples) were reported above the adopted assessment criteria.
- No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the surface water monitoring locations in Q3 2022.

The porewater laboratory results reported the following:

- Of the 39 samples that were tested, PFOS (11 samples) and Sum of PFOS and PFHxS (2 samples) reported concentrations above adopted assessment criteria.
- No first-time detection of PFOA or the sum of PFOS and PFHxS above the LOR or new exceedance of guideline values were reported for the porewater monitoring locations in Q3 2022.

The sediment laboratory results reported the following:

- SD341 located at the FTA recorded a first-time detection of Sum of PFOS and PFHxS (0.0004 mg/kg detected).
- No new exceedance of guideline values was reported for the sediment monitoring locations in Q3 2022.

The following actions should be undertaken prior to the next OMP sampling event:

- Replacement of the ground water monitoring wells lost/damaged at the demolition ground (MW147, MW272) and main base area (MW517, MW264, MW518, MW248, MW010).
- Protection of monitoring well MW239 at the AVCAT storage area.

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q4 2022), scheduled for December 2022. An Annual Interpretive Report will be prepared for the October 2021 – September 2022 monitoring period.

6 References

General References

1. Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds*.
2. Australian Standard AS 4482-1999 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 2 – Volatile substances*.
3. *Contaminated Sites Act 2003*, Western Australia.
4. Department of Defence, 2021, *Defence Contamination Management Manual* (DCMM) *Annex L Data Management*.
5. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement *Technical Guidelines for the Estimation of Emissions by Facilities in Australia*.
6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
8. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, '*Guidance on Environmental Data Verification and Data Validation'.*
9. The Heads of EPAs Australia and New Zealand (HEPA; 2020) *PFAS National Environmental Management Plan (NEMP) 2.0*, January 2020.
10. National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011 – updated 2018) *National Water Quality Management Strategy Australian Drinking Water Guidelines 6*, August 2018
12. NHMRC, August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.
13. Standards Australia/Standards New Zealand (1998) AS5667.1:1998 *'Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'*.
14. U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4).*
15. USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*

Site Specific References

16. Department of Defence, January 2019, *HMAS Stirling Garden Island PFAS Management Area Plan*, Final.
17. Cardno, 11 August 2022, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling*. Rev 7
18. Cardno, 16 April 2020, *PFAS OMP 2019 Q4 Quarterly Monitoring Factual Report*, HMAS Stirling
19. Cardno, 14 May 2020, *PFAS OMP 2020 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling
20. Cardno, 23 September 2020, *PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling
21. Cardno, 22 January 2021, *PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling
22. Cardno, March 2021, *PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling
23. Cardno, June 2021, *PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling
24. Cardno, August 2021, *PFAS OMP 2021 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling
25. Cardno, September 2021, *PFAS OMP – 2020 Annual Interpretive Report*, HMAS Stirling
26. Cardno, November 2021, *PFAS OMP 2021 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling
27. Cardno, April 2022, *PFAS OMP 2021 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling

28. Cardno, now Stantec, October 2022, *draft PFAS OMP 2021 Annual Interpretive Report*

29. Cardno, now Stantec, July 2022, *PFAS OMP 2022 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling

30. Cardno, now Stantec, October 2022, *PFAS OMP 2022 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling

31. RPS, October 2018, *HMAS Stirling - PFAS Ongoing Monitoring Plan*, Ref. EEC16094.005 (RPS, 2018a).

32. RPS, May 2018, *Detailed Site Investigation – HMAS Stirling PFAS Investigation*, Ref. EEC16094.003 (RPS, 2018b).

33. RPS, September 2018, *HMAS Stirling Garden Island PFAS Investigation Ecological Risk Assessment*. Ref. EEC16094.009 (RPS, 2018c).

APPENDIX

A

FIGURES

Cardno

now

Stantec



FIGURE 1A

1:32,000 Scale at A3

Meters

0 500 1,000

Site Location

Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001A_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map

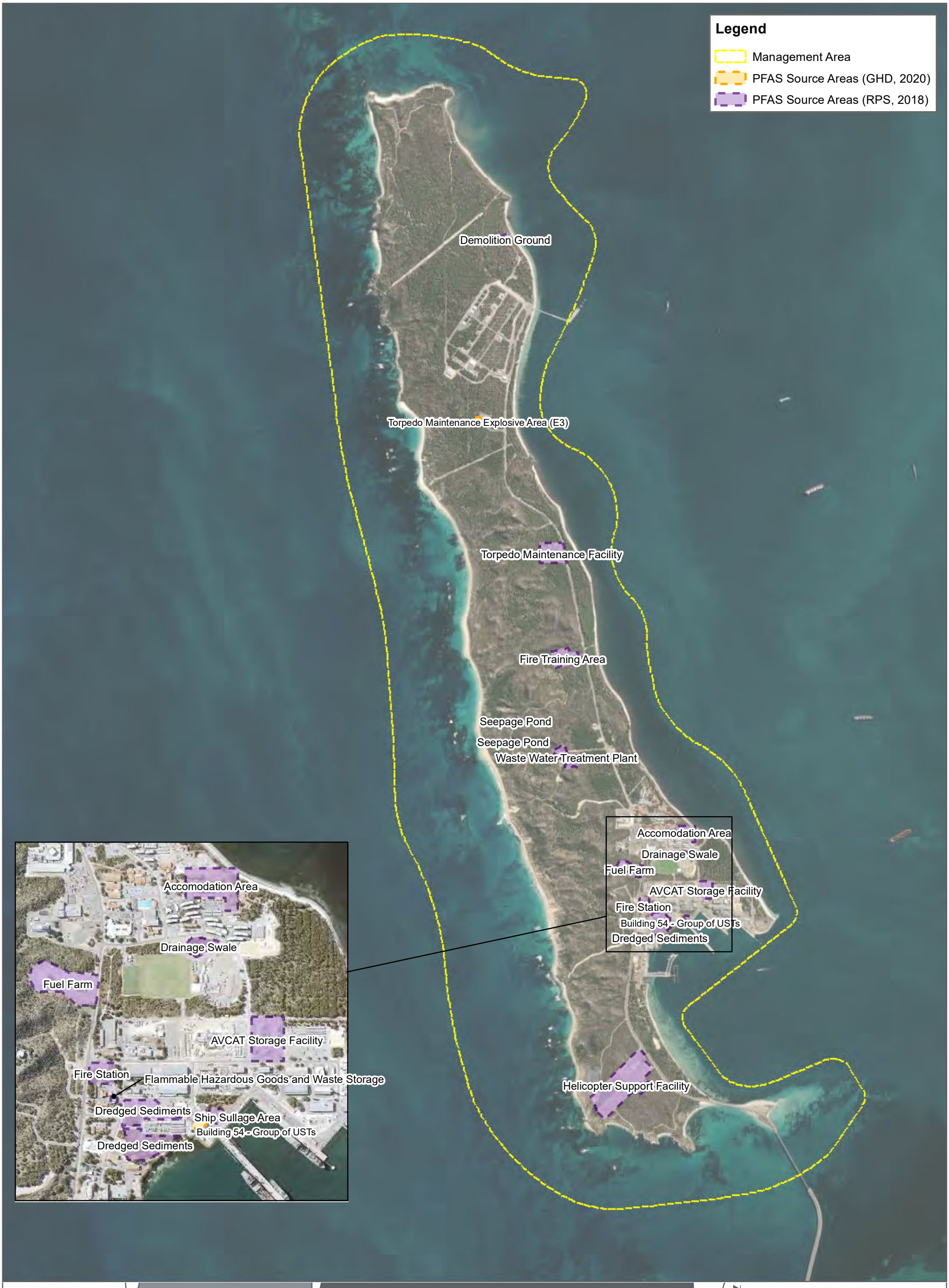


FIGURE 1B

1:32,000 Scale at A3

Meters

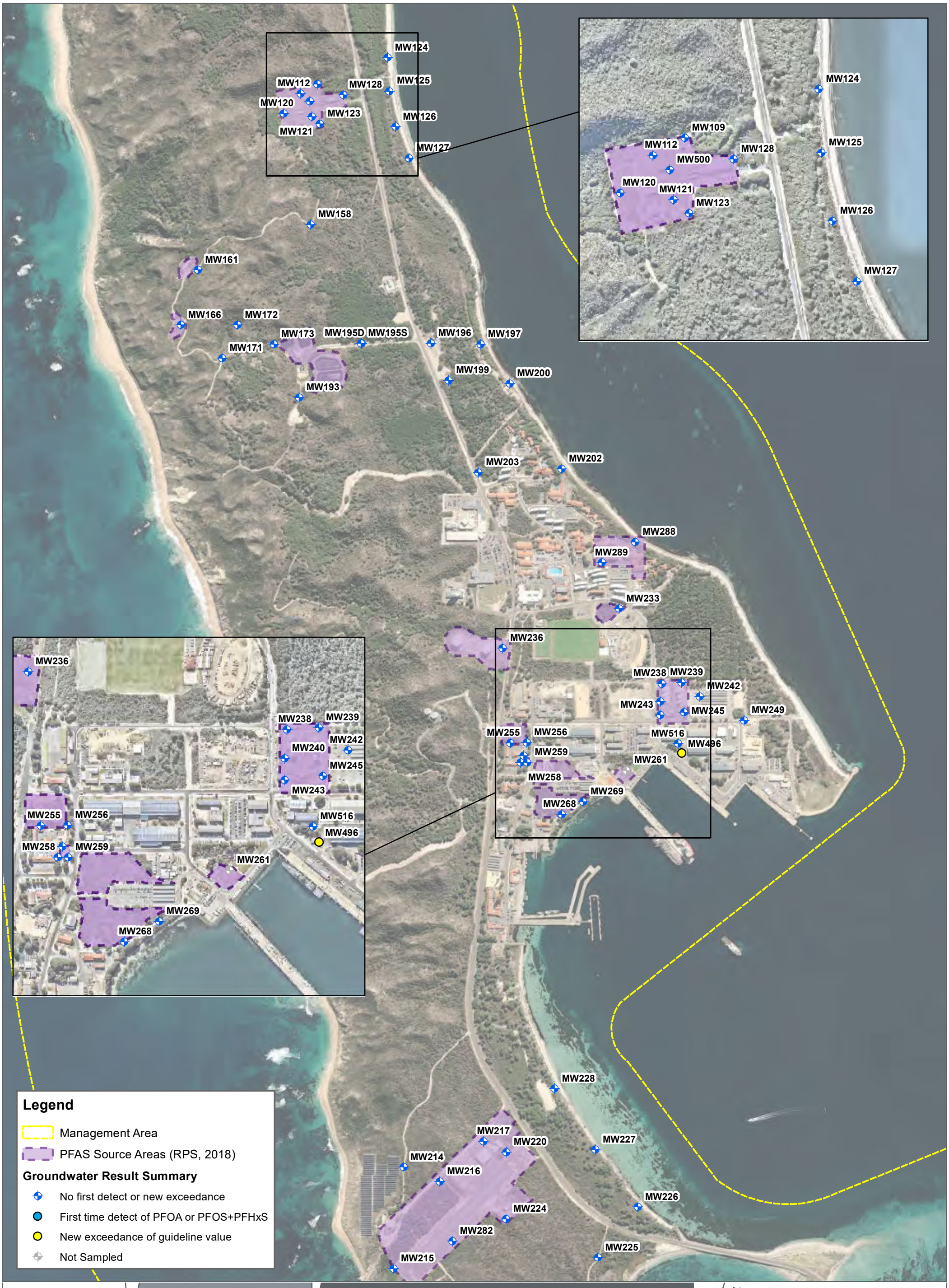
0 500 1,000

Management Area

Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap


MW124
MW112
MW128
MW125
MW120
MW123
MW126
MW121
MW127
MW158
MW161
MW166
MW172
MW173
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MW195S
MW196
MW197
MW171
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW240
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MW255
MW256
MW516
MW496
MW258
MW259
MW261
MW269
MW268
MW109
MW500
MW249
MW241
MW257
MW254
MW253
MW252
MW251
MW250
MW228
MW217
MW220
MW227
MW214
MW216
MW224
MW226
MW282
MW225
MW215
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Result Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
Not Sampled
FIGURE 2A
1:12,500 Scale at A3
Meters
0
300
600
Groundwater Results
Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2022Q2_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap



FIGURE 2B

1:15,000 Scale at A3

Meters

0 250 500

Groundwater Results

Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
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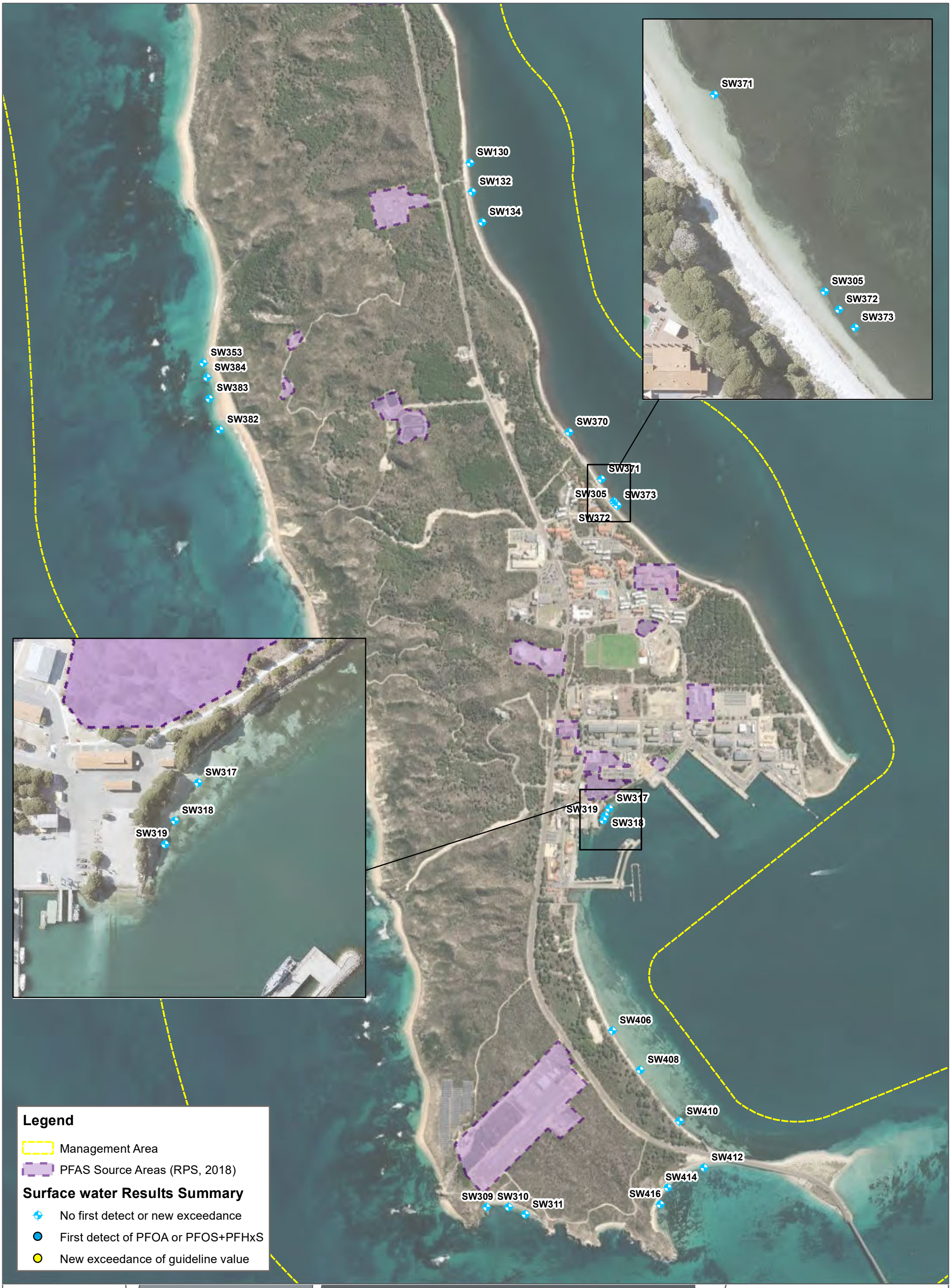

FIGURE 3A

1:15,000 Scale at A3

Meters

0 300 600

Surface water Results

Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
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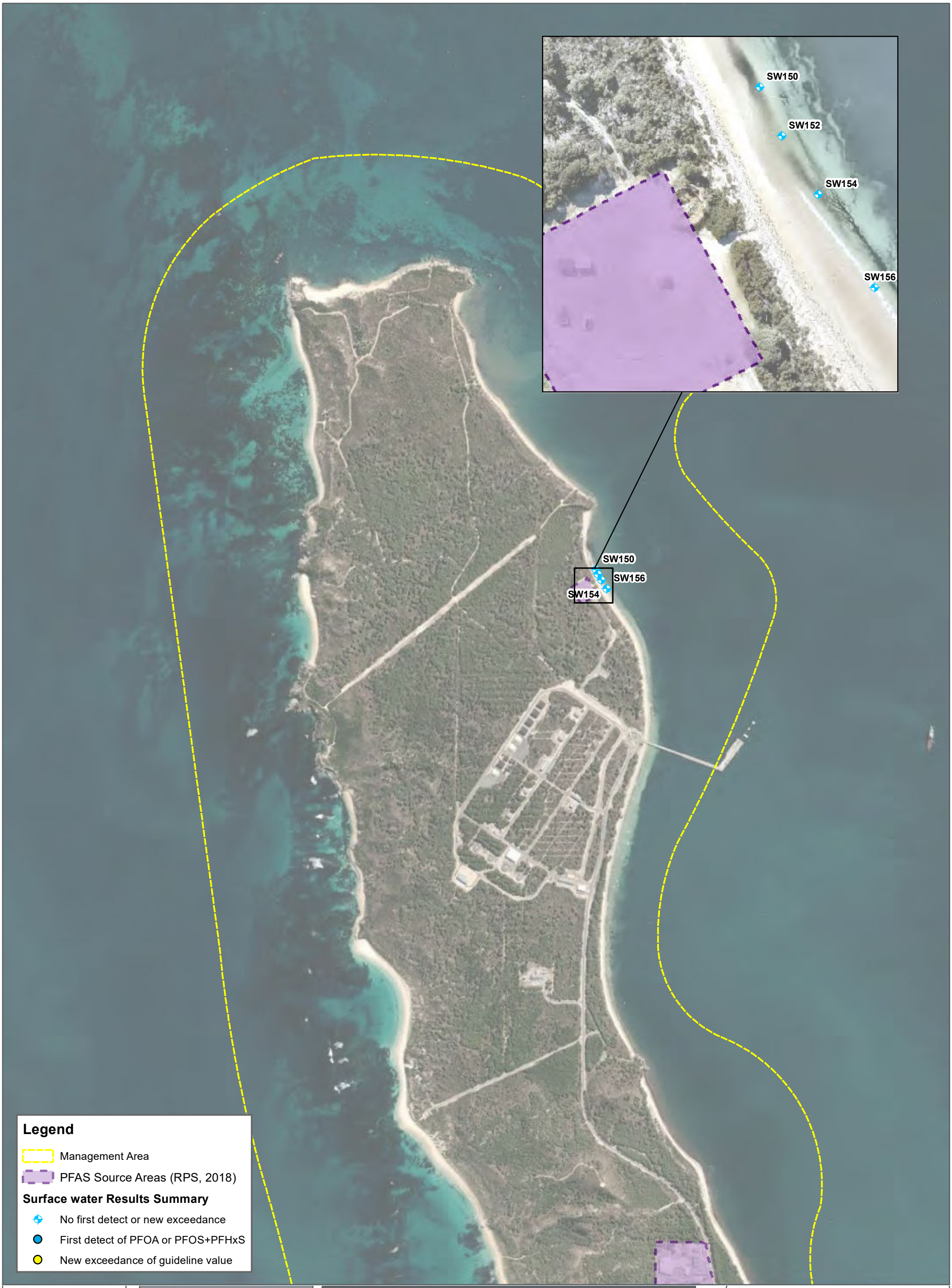

FIGURE 3B

1:15,000 Scale at A3

Meters

0 300 600

Surface water Results

Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
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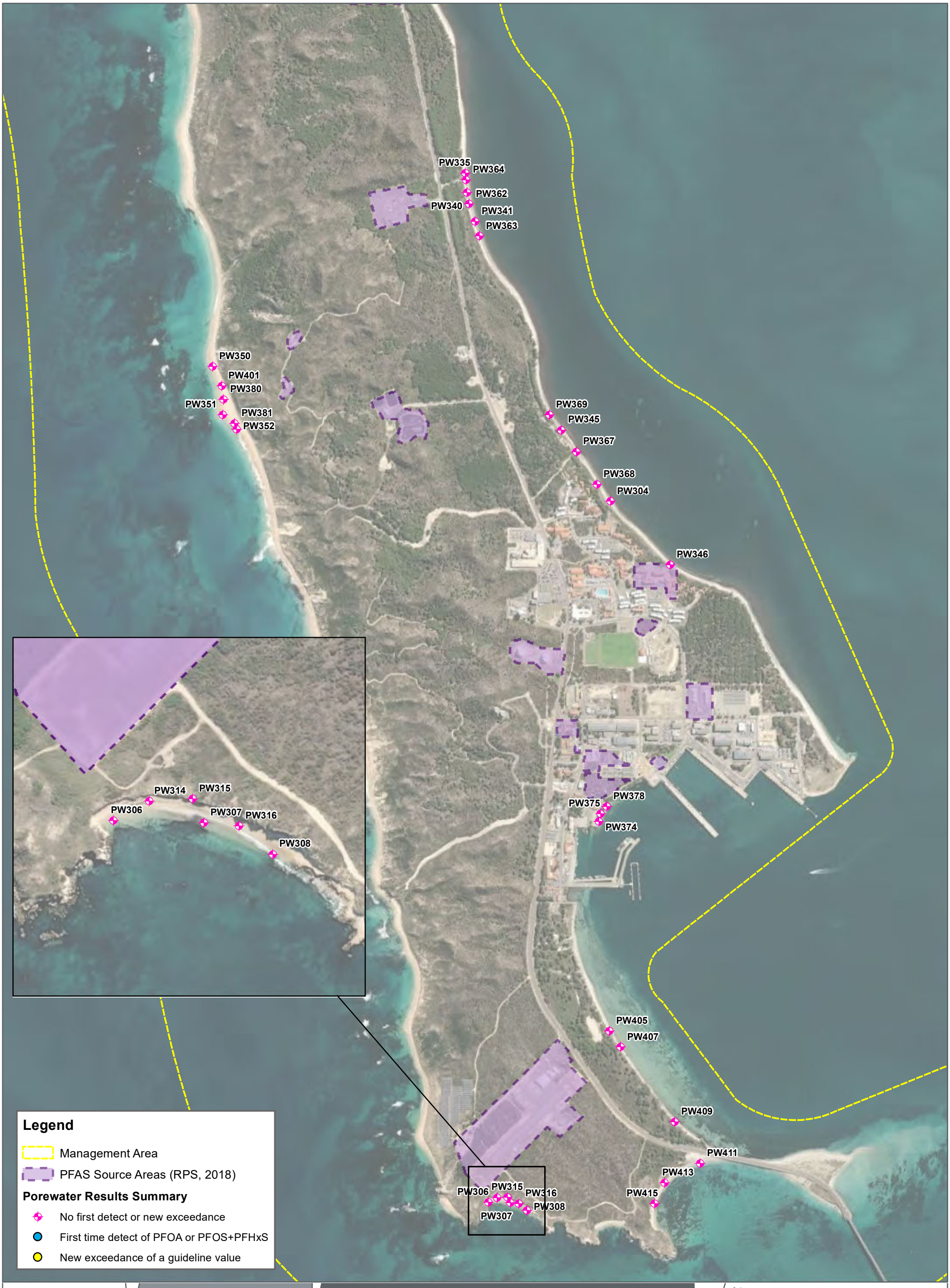
PW335
PW364
PW362
PW340
PW341
PW363
PW350
PW401
PW380
PW351
PW381
PW352
PW369
PW345
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PW368
PW304
PW346
PW314
PW315
PW306
PW307
PW316
PW308
PW378
PW375
PW374
PW405
PW407
PW409
PW411
PW413
PW415
PW306
PW315
PW316
PW308
PW307
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Porewater Results Summary
No first detect or new exceedance
First time detect of PFOA or PFOS+PFHxS
New exceedance of a guideline value
FIGURE 4A
1:15,000 Scale at A3
Meters
0
300
600
Porewater Results
Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004A_2022Q3_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

PW356
PW331
PW357
PW330
PW358
PW329
PW356
PW358
PW329
PW357

Legend

- Management Area
- PFAS Source Areas (RPS, 2018)

Porewater Results Summary

- No first detect or new exceedance
- First time detect of PFOA or PFOS+PFHxS
- New exceedance of a guideline value

FIGURE 4B

1:15,000 Scale at A3

Meters

0 300 600

Porewater Results

Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
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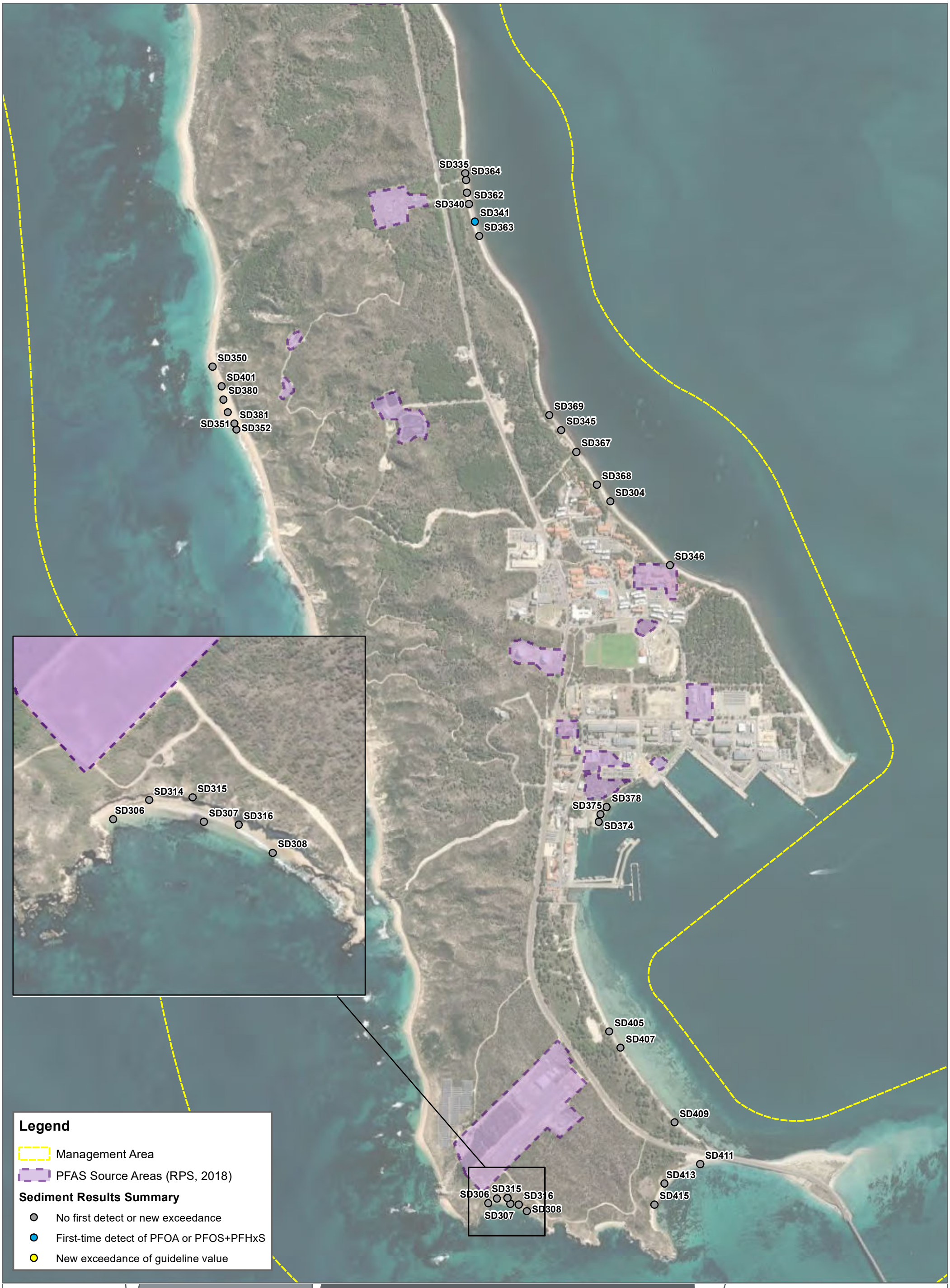
SD335
SD364
SD362
SD340
SD341
SD363
SD350
SD401
SD380
SD381
SD351
SD352
SD369
SD345
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SD368
SD304
SD346
SD314
SD315
SD306
SD307
SD316
SD308
SD375
SD378
SD374
SD405
SD407
SD409
SD411
SD413
SD415
SD306
SD315
SD316
SD307
SD308
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sediment Results Summary
No first detect or new exceedance
First-time detect of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 5A
1:15,000 Scale at A3
Meters
0
300
600
Sediment Results
Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2022Q3_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 5B

1:15,000 Scale at A3

Meters

0 300 600

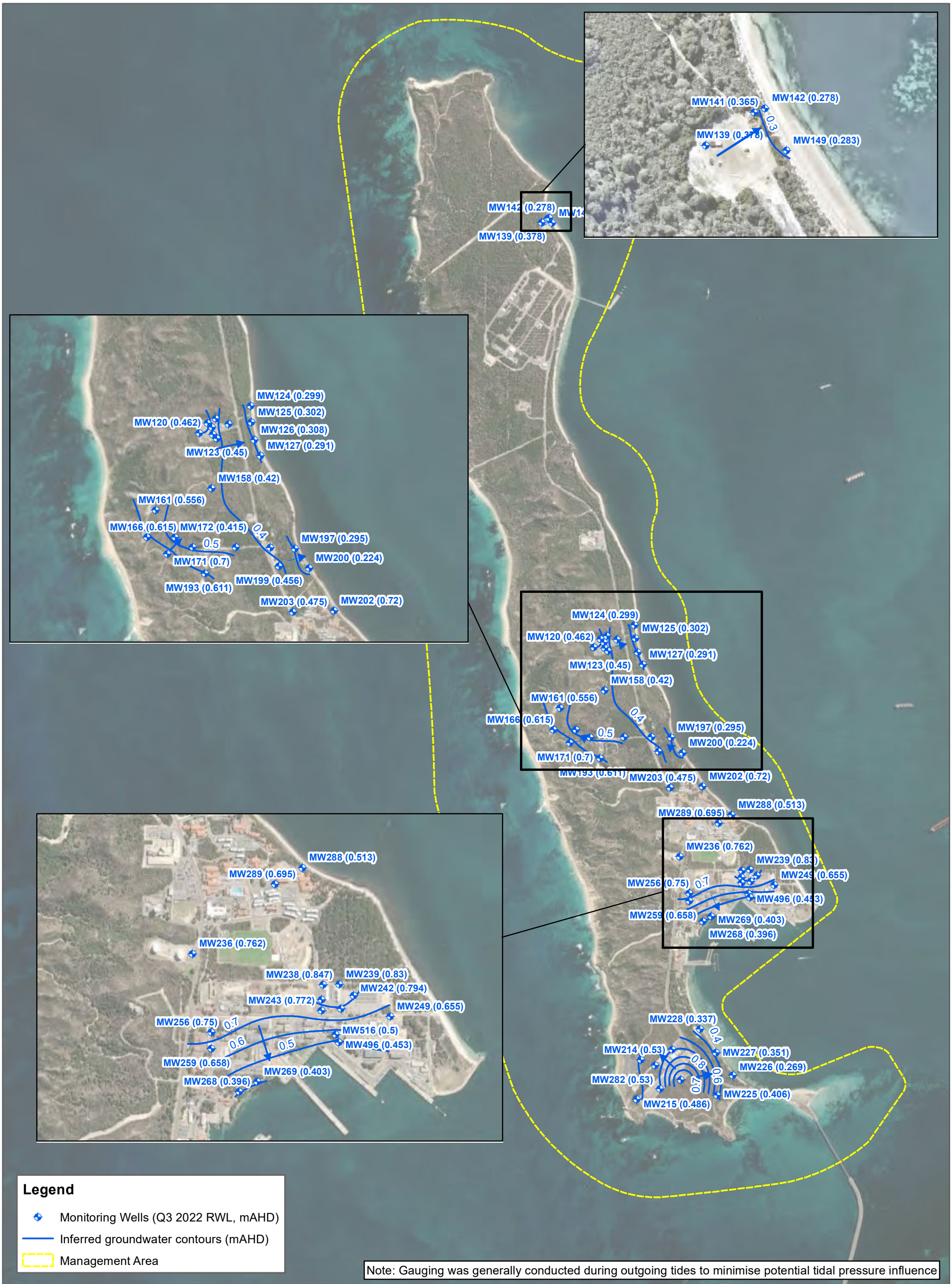
Sediment Results

Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2022Q3_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


MW141 (0.365)
MW142 (0.278)
0.3
MW139 (0.378)
MW149 (0.283)
MW142 (0.278)
MW139 (0.378)
MW124 (0.299)
MW125 (0.302)
MW120 (0.462)
MW126 (0.308)
MW127 (0.291)
MW123 (0.45)
MW158 (0.42)
MW161 (0.556)
MW166 (0.615)
MW172 (0.415)
0.4
0.5
MW197 (0.295)
MW200 (0.224)
MW171 (0.7)
MW199 (0.456)
MW193 (0.611)
MW203 (0.475)
MW202 (0.72)
MW288 (0.513)
MW289 (0.695)
MW236 (0.762)
MW238 (0.847)
MW239 (0.83)
MW242 (0.794)
MW243 (0.772)
MW249 (0.655)
MW256 (0.75)
0.7
0.6
MW516 (0.5)
MW496 (0.453)
MW259 (0.658)
MW269 (0.403)
MW268 (0.396)
MW228 (0.337)
0.8
MW214 (0.53)
MW227 (0.351)
MW226 (0.269)
MW282 (0.53)
MW225 (0.406)
MW215 (0.486)
Legend
Monitoring Wells (Q3 2022 RWL, mAHD)
Inferred groundwater contours (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence
FIGURE 6
1:32,000 Scale at A3
Meters
0
500
1,000
Inferred Groundwater Contours
Q3 2022 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2022-10-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2022Q3_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

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Stantec

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids			
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01
PFAS NEMP 2020 Drinking Water																*0.56*										
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19										
PFAS NEMP 2020 Recreational Water																**10**										
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**																					
Fire Training Area	**MW109**	**5/09/2022**	**0089_MW109_220905**	**Normal**	**EP2211343**	0.06	0.14	0.53	<0.02	0.08	<0.02	<0.1	<0.02	0.09	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW109**	**5/09/2022**	**0089_QC117_220905**	**Field Duplicate**	**EP2211343**	0.06	0.14	0.53	<0.02	0.09	<0.02	<0.1	<0.02	0.08	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW109**	**5/09/2022**	**0089_QC217_220905**	**Interlab Duplicate**	**920981**	0.06	0.09	0.32	0.01	0.07	<0.01	<0.05	<0.01	0.05	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	**MW112**	**5/09/2022**	**0089_MW112_220905**	**Normal**	**EP2211343**	0.07	0.21	8.15	0.98	59.5	<0.02	<0.1	0.18	0.73	0.28	*1.40*	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW120**	**5/09/2022**	**0089_MW120_220905**	**Normal**	**EP2211343**	0.03	0.07	22.2	3.67	0.36	<0.02	<0.1	<0.02	0.11	<0.02	*2.00*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW120**	**5/09/2022**	**0089_QC116_220905**	**Field Duplicate**	**EP2211343**	0.02	0.08	21.5	3.54	0.33	<0.02	<0.1	<0.02	0.12	<0.02	*2.00*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW120**	**5/09/2022**	**0089_QC216_220905**	**Interlab Duplicate**	**920981**	0.02	0.11	17	2.1	0.28	<0.01	<0.05	0.01	0.07	0.01	*1.4*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	**MW121**	**5/09/2022**	**0089_MW121_220905**	**Normal**	**EP2211343**	<0.02	<0.02	0.10	<0.02	0.09	<0.02	<0.1	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW123**	**5/09/2022**	**0089_MW123_220905**	**Normal**	**EP2211343**	0.10	0.10	0.24	<0.02	0.04	<0.02	<0.1	0.04	0.19	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW123**	**5/09/2022**	**0089_QC114_220905**	**Field Duplicate**	**EP2211343**	0.13	0.13	0.41	<0.02	0.04	<0.02	<0.1	0.06	0.26	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW123**	**5/09/2022**	**0089_QC214_220905**	**Interlab Duplicate**	**920981**	0.07	0.06	0.19	<0.01	0.02	<0.01	<0.05	0.03	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	**MW124**	**5/09/2022**	**0089_MW124_220905**	**Normal**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW124**	**5/09/2022**	**0089_QC102_220905**	**Field Duplicate**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW124**	**5/09/2022**	**0089_QC202_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	**MW125**	**5/09/2022**	**0089_MW125_220905**	**Normal**	**EP2211345**	0.14	0.12	0.49	<0.02	0.01	<0.02	<0.1	0.03	0.13	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW126**	**5/09/2022**	**0089_MW126_220905**	**Normal**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW127**	**5/09/2022**	**0089_MW127_220905**	**Normal**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW127**	**5/09/2022**	**0089_QC113_220905**	**Field Duplicate**	**EP2211345**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW127**	**5/09/2022**	**0089_QC213_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	**MW128**	**5/09/2022**	**0089_MW128_220905**	**Normal**	**EP2211343**	<0.02	<0.02	0.41	0.09	7.38	<0.02	<0.1	<0.02	0.05	<0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**MW139**	**5/09/2022**	**0089_MW139_220905**	**Normal**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**MW141**	**5/09/2022**	**0089_MW141_220905**	**Normal**	**EP2211343**	0.58	1.94	29.2	2.35	102	<0.02	0.3	1.30	13.4	0.54	*2.86*	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**MW141**	**5/09/2022**	**0089_QC101_220905**	**Field Duplicate**	**EP2211343**	0.52	1.75	27.3	2.08	102	<0.02	0.3	1.29	13.0	0.50	*2.68*	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**MW141**	**5/09/2022**	**0089_QC201_220905**	**Interlab Duplicate**	**920981**	0.49	0.96	22	1.2	60	<0.01	0.23	1.1	4.6	0.36	*1.8*	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**MW142**	**5/09/2022**	**0089_MW142_220905**	**Normal**	**EP2211343**	0.11	0.25	6.64	0.13	2.77	<0.02	0.1	0.29	2.55	0.07	0.41	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**MW149**	**5/09/2022**	**0089_MW149_220905**	**Normal**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW158**	**5/09/2022**	**0089_MW158_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW161**	**5/09/2022**	**0089_MW161_220905**	**Normal**	**EP2211340**	<0.02	<0.02	0.23	0.03	3.02	<0.02	<0.1	0.08	0.08	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW166**	**5/09/2022**	**0089_MW166_220905**	**Normal**	**EP2211340**	<0.02	0.02	0.52	0.08	6.18	<0.02	<0.1	0.24	0.23	0.12	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW171**	**5/09/2022**	**0089_MW171_220905**	**Normal**	**EP2211340**	0.03	<0.02	0.08	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW172**	**6/09/2022**	**0089_MW172_220906**	**Normal**	**EP2211400**	1.34	1.29	12.2	2.37	17.4	<0.02	0.5	0.61	2.52	0.23	*0.59*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW173**	**5/09/2022**	**0089_MW173_220905**	**Normal**	**EP2211340**	0.21	0.18	3.74	0.59	5.46	<0.02	<0.1	0.14	0.50	0.08	0.35	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW193**	**5/09/2022**	**0089_MW193_220905**	**Normal**	**EP2211340**	0.55	0.97	9.84	0.65	3.08	<0.02	0.2	0.27	1.60	0.12	0.52	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW195D**	**5/09/2022**	**0089_MW195D_220905**	**Normal**	**EP2211340**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW195S**	**5/09/2022**	**0089_MW195S_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW196**	**6/09/2022**	**0089_MW196_220906**	**Normal**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW197**	**5/09/2022**	**0089_MW197_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW199**	**5/09/2022**	**0089_MW199_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW199**	**5/09/2022**	**0089_QC111_220905**	**Field Duplicate**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW199**	**5/09/2022**	**0089_QC211_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
WWTP	**MW200**	**5/09/2022**	**0089_MW200_220905**	**Normal**	**EP2211340**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW202**	**5/09/2022**	**0089_MW202_220905**	**Normal**	**EP2211345**	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP	**MW203**	**6/09/2022**	**0089_MW203_220906**	**Normal**	**EP2211390**	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**MW214**	**6/09/2022**	**0089_MW214_220906**	**Normal**	**EP2211400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**MW215**	**6/09/2022**	**0089_MW215_220906**	**Normal**	**EP2211400**	0.09	0.13	0.73	<0.02	<0.01	<0.02	<0.1	0.07	0.24	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**MW216**	**5/09/2022**	**0089_MW216_220905**	**Normal**	**EP2211340**	0.32	0.47	3.21	0.11	0.98	<0.02	2.3	9.12	6.45	0.31	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.58	<0.05	<0.05
Helicopter Support Facility	**MW217**	**8/09/2022**	**0089_MW217_220908**	**Normal**	**EP2211535**	<0.02	0.04	0.05	<0.02	0.05	<0.02	1.0	4.61	4.44	1.23	0.37	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	12.5	0.24	<0.05
Helicopter Support Facility	**MW220**	**8/09/2022**	**0089_MW220_220908**	**Normal**	**EP2211535**	0.26	0.20	4.21	0.55	30.2	<0.02	0.2	0.51	1.08	0.21	0.45	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.14	<0.05	<0.05
Helicopter Support Facility	**MW224**	**8/09/2022**	**0089_MW224_220908**	**Normal**	**EP2211535**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**MW225**	**6/09/2022**	**0089_MW225_220906**	**Normal**	**EP2211400**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**MW226**	**6/09/2022**	**0089_MW226_220906**	**Normal**	**EP2211390**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**MW227**	**7/09/2022**	**0089_MW227_220907**	**Normal**	**EP2211611**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.10	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**MW228**	**7/09/2022**	**0089_MW228_220907**	**Normal**	**EP2211495**	0.08	0.06	0.12	<0.02	<0.01	<0.02	0.7	2.90	3.03	0.94	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.24	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW233**	**6/09/2022**	**0089_MW233_220906**	**Normal**	**EP2211390**	<0.02	<0.02	0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW236**	**6/09/2022**	**0089_MW236_220906**	**Normal**	**EP2211390**	0.39	1.17	48.1	0.49	68.9	<0.02	0.1	0.21	1.35	0.87	*1.70*	3.35	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW238**	**6/09/2022**	**0089_MW238_220906**	**Normal**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW239**	**6/09/2022**	**0089_MW239_220906**	**Normal**	**EP2211389**	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW240**	**6/09/2022**	**0089_MW240_220906**	**Normal**	**EP2211389**	<0.02	0.06	3.80	<0.02	<0.01	<0.02	<0.1	<0.02	0.16	0.04	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW242**	**6/09/2022**	**0089_MW242_220906**	**Normal**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW243**	**6/09/2022**	**0089_MW243_220906**	**Normal**	**EP2211389**	<0.02	<0.02	0.11	<0.02	0.16	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW245**	**6/09/2022**	**0089_MW245_220906**	**Normal**	**EP2211389**	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW249**	**6/09/2022**	**0089_MW249_220906**	**Normal**	**EP2211389**	<0.02	<0.02	0.15	<0.02	0.08	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW255**	**6/09/2022**	**0089_MW255_220906**	**Normal**	**EP2211389**	0.13	0.33	0.94	<0.02	0.95	<0.02	<0.1	0.09	0.52	0.19	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW256**	**6/09/2022**	**0089_MW256_220906**	**Normal**	**EP2211389**	0.93	0.41	3.32	0.15	9.10	<0.02	0.6	0.59	1.19	0.11	0.19	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW257**	**6/09/2022**	**0089_MW257_220906**	**Normal**	**EP2211389**	<0.02	<0.02	0.16	<0.02	0.20	<0.02	<0.1	0.04	0.05	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW258**	**6/09/2022**	**0089_MW258_220906**	**Normal**	**EP2211389**	6.69	5.32	15.7	0.42	9.12	<0.02	1.5	2.99	9.00	0.83	*0.58*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.18	<0.05	<0.05
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW259**	**6/09/2022**	**0089_MW259_220906**	**Normal**	**EP2211389**	0.03	0.08	0.22	<0.02	0.18	<0.02	<0.1	0.13	0.17	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**MW268**	**6/09/2022**	**0089_MW268_220906**	**Normal**	**EP2211390**	0.06	0.08	0.58	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**MW269**	**6/09/2022**	**0089_MW269_220906**	**Normal**	**EP2211390**	0.06	0.09	0.63	<0.02	0.51	<0.02	<0.1	0.03	0.12	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**MW282**	**8/09/2022**	**0089_MW282_220908**	**Normal**	**EP2211535**	0.13	0.28	17.0	10.2	103	<0.02	<0.1	0.15	0.92	0.47	*9.32*	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Accomodation Area	**MW288**	**6/09/2022**	**0089_MW288_220906**	**Normal**	**EP2211390**	<0.02	<0.02	0.02	<0.02	4.63	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Accomodation Area	**MW289**	**5/09/2022**	**0089_MW289_220905**	**Normal**	**EP2211345**	0.07	0.07	0.59	0.03	1.61	<0.02	<0.1	0.04	0.08	0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW496**	**6/09/2022**	**0089_MW496_220906**	**Normal**	**EP2211389**	0.07	0.13	1.85	0.18	6.95	<0.02	<0.1	<0.02	0.22	0.05	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**MW500**	**5/09/2022**	**0089_MW500_220905**	**Normal**	**EP2211343**	0.32	0.70	13.3	2.27	57.8	<0.02	0.2	0.30	1.92	0.31	*1.22*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
AVCAT Storage and Fuel Farm	**MW516**	**6/09/2022**	**0089_MW516_220906**	**Normal**	**EP2211389**	0.25	0.29	1.89	0.14	4.32	<0.02	<0.1	<0.02	0.23	0.03	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW304**	**5/09/2022**	**0089_PW304_220905**	**Normal**	**EP2211344**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW306**	**6/09/2022**	**0089_PW306_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW307**	**6/09/2022**	**0089_PW307_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW308**	**6/09/2022**	**0089_PW308_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02

Table B1 - Groundwater, porewater and surface water analytical Results

								PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer Sulfonic Acids			
								Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
								µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting								0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01
PFAS NEMP 2020 Drinking Water																		*0.56*										
PFAS NEMP 2020 Interim Marine 99%												0.00023*						19										
PFAS NEMP 2020 Recreational Water																		**10**										
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**																							
Demolition Ground	**PW358**	**5/09/2022**	**0089_PW358_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW362**	**5/09/2022**	**0089_PW362_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW362**	**5/09/2022**	**0089_QC108_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW362**	**5/09/2022**	**0089_QC208_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
Fire Training Area	**PW363**	**5/09/2022**	**0089_PW363_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW364**	**5/09/2022**	**0089_PW364_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW367**	**5/09/2022**	**0089_PW367_220905**	**Normal**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW367**	**5/09/2022**	**0089_QC110_220905**	**Field Duplicate**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW367**	**5/09/2022**	**0089_QC210_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
WWTP (East)	**PW368**	**5/09/2022**	**0089_PW368_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW368**	**5/09/2022**	**0089_QC118_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW368**	**5/09/2022**	**0089_QC218_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
WWTP (East)	**PW369**	**5/09/2022**	**0089_PW369_220905**	**Normal**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW374**	**6/09/2022**	**0089_PW374_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW375**	**6/09/2022**	**0089_PW375_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW378**	**6/09/2022**	**0089_PW378_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW380**	**7/09/2022**	**0089_PW380_220907**	**Normal**	**EP2211496**	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW381**	**7/09/2022**	**0089_PW381_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW401**	**7/09/2022**	**0089_PW401_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW405**	**7/09/2022**	**0089_PW405_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW407**	**7/09/2022**	**0089_PW407_220907**	**Normal**	**EP2211498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW409**	**6/09/2022**	**0089_PW409_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW411**	**6/09/2022**	**0089_PW411_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW413**	**6/09/2022**	**0089_PW413_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW415**	**6/09/2022**	**0089_PW415_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**SW130**	**5/09/2022**	**0089_SW130_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**SW132**	**5/09/2022**	**0089_QC104_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**SW132**	**5/09/2022**	**0089_QC204_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
Fire Training Area	**SW132**	**5/09/2022**	**0089_SW132_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**SW134**	**5/09/2022**	**0089_SW134_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW150**	**5/09/2022**	**0089_SW150_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW152**	**5/09/2022**	**0089_QC103_220905**	**Field Duplicate**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW152**	**5/09/2022**	**0089_QC203_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
Demolition Ground	**SW152**	**5/09/2022**	**0089_SW152_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW154**	**5/09/2022**	**0089_SW154_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**SW156**	**5/09/2022**	**0089_SW156_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW305**	**5/09/2022**	**0089_QC115_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW305**	**5/09/2022**	**0089_QC215_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
WWTP (East)	**SW305**	**5/09/2022**	**0089_SW305_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**SW309**	**6/09/2022**	**0089_SW309_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**SW310**	**6/09/2022**	**0089_SW310_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**SW311**	**6/09/2022**	**0089_SW311_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW317**	**6/09/2022**	**0089_SW317_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW318**	**6/09/2022**	**0089_SW318_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**SW319**	**6/09/2022**	**0089_SW319_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**SW353**	**7/09/2022**	**0089_SW353_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW370**	**5/09/2022**	**0089_SW370_220905**	**Normal**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW371**	**5/09/2022**	**0089_SW371_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW372**	**6/09/2022**	**0089_SW372_220906**	**Normal**	**EP2211391**	<0.02	<0.02	0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**SW373**	**6/09/2022**	**0089_SW373_220906**	**Normal**	**EP2211391**	<0.02	<0.02	0.01	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**SW382**	**7/09/2022**	**0089_SW382_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**SW383**	**7/09/2022**	**0089_SW383_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**SW384**	**7/09/2022**	**0089_SW384_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**SW406**	**7/09/2022**	**0089_SW406_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**SW408**	**7/09/2022**	**0089_SW408_220907**	**Normal**	**EP2211498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**SW410**	**6/09/2022**	**0089_SW410_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**SW412**	**6/09/2022**	**0089_SW412_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**SW414**	**6/09/2022**	**0089_SW414_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**SW416**	**6/09/2022**	**0089_SW416_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

						PFAS - Perfluoroalkyl Sulfonamides							PFAS			Metals			
						Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N- Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N- Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1
PFAS NEMP 2020 Drinking Water													*0.07*						
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water													**2**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**														
Fire Training Area	**MW109**	**5/09/2022**	**0089_MW109_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.61***	0.77	0.91	92	20	1	63
Fire Training Area	**MW109**	**5/09/2022**	**0089_QC117_220905**	**Field Duplicate**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.62***	0.78	0.92	93	20	1	64
Fire Training Area	**MW109**	**5/09/2022**	**0089_QC217_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***0.39***	0.51	0.62				
Fire Training Area	**MW112**	**5/09/2022**	**0089_MW112_220905**	**Normal**	**EP2211343**	0.69	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***67.6***	70.3	72.2	70	9	<1	15
Fire Training Area	**MW120**	**5/09/2022**	**0089_MW120_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***22.6***	24.7	28.4	72	18	3	34
Fire Training Area	**MW120**	**5/09/2022**	**0089_QC116_220905**	**Field Duplicate**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***21.8***	24.0	27.6	73	18	3	34
Fire Training Area	**MW120**	**5/09/2022**	**0089_QC216_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***17.28***	18.79	21				
Fire Training Area	**MW121**	**5/09/2022**	**0089_MW121_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.19***	0.23	0.23	66	10	3	18
Fire Training Area	**MW123**	**5/09/2022**	**0089_MW123_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.28***	0.61	0.71	100	33	5	106
Fire Training Area	**MW123**	**5/09/2022**	**0089_QC114_220905**	**Field Duplicate**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.45***	0.90	1.03	101	30	4	94
Fire Training Area	**MW123**	**5/09/2022**	**0089_QC214_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***0.21***	0.41	0.49				
Fire Training Area	**MW124**	**5/09/2022**	**0089_MW124_220905**	**Normal**	**EP2211345**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	450	1,110	433	8,340
Fire Training Area	**MW124**	**5/09/2022**	**0089_QC102_220905**	**Field Duplicate**	**EP2211345**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	444	1,110	431	8,240
Fire Training Area	**MW124**	**5/09/2022**	**0089_QC202_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1				
Fire Training Area	**MW125**	**5/09/2022**	**0089_MW125_220905**	**Normal**	**EP2211345**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.50***	0.80	0.92	466	1,220	469	8,800
Fire Training Area	**MW126**	**5/09/2022**	**0089_MW126_220905**	**Normal**	**EP2211345**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	408	1,130	397	7,850
Fire Training Area	**MW127**	**5/09/2022**	**0089_MW127_220905**	**Normal**	**EP2211345**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	383	1,070	369	7,230
Fire Training Area	**MW127**	**5/09/2022**	**0089_QC113_220905**	**Field Duplicate**	**EP2211345**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	411	1,160	400	7,810
Fire Training Area	**MW127**	**5/09/2022**	**0089_QC213_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
Fire Training Area	**MW128**	**5/09/2022**	**0089_MW128_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.79***	7.93	8.02	68	26	5	52
Demolition Ground	**MW139**	**5/09/2022**	**0089_MW139_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	82	50	15	297
Demolition Ground	**MW141**	**5/09/2022**	**0089_MW141_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***131***	150	154	412	607	209	4,190
Demolition Ground	**MW141**	**5/09/2022**	**0089_QC101_220905**	**Field Duplicate**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***129***	148	151	396	679	241	4,710
Demolition Ground	**MW141**	**5/09/2022**	**0089_QC201_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***82***	90.58	92.98				
Demolition Ground	**MW142**	**5/09/2022**	**0089_MW142_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.41***	12.9	13.3	358	803	284	5,570
Demolition Ground	**MW149**	**5/09/2022**	**0089_MW149_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	397	1,230	453	8,650
WWTP	**MW158**	**5/09/2022**	**0089_MW158_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	195	334	103	2,260
WWTP	**MW161**	**5/09/2022**	**0089_MW161_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.25***	3.46	3.49	87	71	36	422
WWTP	**MW166**	**5/09/2022**	**0089_MW166_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.70***	7.35	7.45	110	93	39	441
WWTP	**MW171**	**5/09/2022**	**0089_MW171_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.16	0.16	196	402	107	2,620
WWTP	**MW172**	**6/09/2022**	**0089_MW172_220906**	**Normal**	**EP2211400**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***29.6***	35.4	39.0	99	117	48	602
WWTP	**MW173**	**5/09/2022**	**0089_MW173_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.20***	10.5	11.2	104	93	46	643
WWTP	**MW193**	**5/09/2022**	**0089_MW193_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.9***	16.2	17.8	107	76	26	320
WWTP	**MW195D**	**5/09/2022**	**0089_MW195D_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	385	834	261	5,890
WWTP	**MW195S**	**5/09/2022**	**0089_MW195S_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	177	132	43	518
WWTP	**MW196**	**6/09/2022**	**0089_MW196_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	66	19	2	23
WWTP	**MW197**	**5/09/2022**	**0089_MW197_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	63	200	32	446
WWTP	**MW199**	**5/09/2022**	**0089_MW199_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	94	47	14	245
WWTP	**MW199**	**5/09/2022**	**0089_QC111_220905**	**Field Duplicate**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	96	61	19	355
WWTP	**MW199**	**5/09/2022**	**0089_QC211_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
WWTP	**MW200**	**5/09/2022**	**0089_MW200_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	94	105	66	1,220
WWTP	**MW202**	**5/09/2022**	**0089_MW202_220905**	**Normal**	**EP2211345**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	121	51	31	287
WWTP	**MW203**	**6/09/2022**	**0089_MW203_220906**	**Normal**	**EP2211390**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	75	39	6	51
Helicopter Support Facility	**MW214**	**6/09/2022**	**0089_MW214_220906**	**Normal**	**EP2211400**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	202	46	8	258
Helicopter Support Facility	**MW215**	**6/09/2022**	**0089_MW215_220906**	**Normal**	**EP2211400**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.73***	1.16	1.29	142	38	11	201
Helicopter Support Facility	**MW216**	**5/09/2022**	**0089_MW216_220905**	**Normal**	**EP2211340**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.19***	24.5	25.1	162	50	8	223
Helicopter Support Facility	**MW217**	**8/09/2022**	**0089_MW217_220908**	**Normal**	**EP2211535**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.10***	24.5	24.5	118	14	11	54
Helicopter Support Facility	**MW220**	**8/09/2022**	**0089_MW220_220908**	**Normal**	**EP2211535**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***34.4***	37.3	38.0	114	18	12	44
Helicopter Support Facility	**MW224**	**8/09/2022**	**0089_MW224_220908**	**Normal**	**EP2211535**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	58	21	4	86
Helicopter Support Facility	**MW225**	**6/09/2022**	**0089_MW225_220906**	**Normal**	**EP2211400**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	124	39	6	174
Helicopter Support Facility	**MW226**	**6/09/2022**	**0089_MW226_220906**	**Normal**	**EP2211390**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	393	1,060	484	7,860
Helicopter Support Facility	**MW227**	**7/09/2022**	**0089_MW227_220907**	**Normal**	**EP2211611**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	134	78	40	574
Helicopter Support Facility	**MW228**	**7/09/2022**	**0089_MW228_220907**	**Normal**	**EP2211495**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.12***	8.11	8.17	117	263	93	1,520
AVCAT Storage and Fuel Farm	**MW233**	**6/09/2022**	**0089_MW233_220906**	**Normal**	**EP2211390**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	34	4	2	10
AVCAT Storage and Fuel Farm	**MW236**	**6/09/2022**	**0089_MW236_220906**	**Normal**	**EP2211390**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***117***	122	127	89	17	<1	28
AVCAT Storage and Fuel Farm	**MW238**	**6/09/2022**	**0089_MW238_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	78	13	3	24
AVCAT Storage and Fuel Farm	**MW239**	**6/09/2022**	**0089_MW239_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	81	11	2	22
AVCAT Storage and Fuel Farm	**MW240**	**6/09/2022**	**0089_MW240_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.80***	4.11	4.17	112	12	3	31
AVCAT Storage and Fuel Farm	**MW242**	**6/09/2022**	**0089_MW242_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	76	17	3	32
AVCAT Storage and Fuel Farm	**MW243**	**6/09/2022**	**0089_MW243_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.27***	0.27	0.27	116	17	5	39
AVCAT Storage and Fuel Farm	**MW245**	**6/09/2022**	**0089_MW245_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.08***	0.08	0.08	105	12	2	16
AVCAT Storage and Fuel Farm	**MW249**	**6/09/2022**	**0089_MW249_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.23***	0.26	0.26	120	42	2	88
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW255**	**6/09/2022**	**0089_MW255_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***1.89***	2.85	3.18	91	22	3	54
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW256**	**6/09/2022**	**0089_MW256_220906**	**Normal**	**EP2211389**	0.07	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.4***	16.0	16.7	156	33	8	165
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW257**	**6/09/2022**	**0089_MW257_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.36***	0.47	0.47	40	4	2	13
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW258**	**6/09/2022**	**0089_MW258_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***24.8***	46.6	52.3	128	27	13	66
Fire Station, Flammable/Hazardous Goods and Waste Storag	**MW259**	**6/09/2022**	**0089_MW259_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.40***	0.73	0.81	62	8	<1	16
Dredge Spoil / Careening Bay	**MW268**	**6/09/2022**	**0089_MW268_220906**	**Normal**	**EP2211390**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.58***	0.69	0.77	190	208	51	861
Dredge Spoil / Careening Bay	**MW269**	**6/09/2022**	**0089_MW269_220906**	**Normal**	**EP2211390**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***1.14***	1.37	1.46	68	58	15	180
Helicopter Support Facility	**MW282**	**8/09/2022**	**0089_MW282_220908**	**Normal**	**EP2211535**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***120***	131	142	137	16	<1	18
Accomodation Area	**MW288**	**6/09/2022**	**0089_MW288_220906**	**Normal**	**EP2211390**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.65***	4.65	4.65	92	22	4	52
Accomodation Area	**MW289**	**5/09/2022**	**0089_MW289_220905**	**Normal**	**EP2211345**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.20***	2.45	2.55	82	20	6	73
AVCAT Storage and Fuel Farm	**MW496**	**6/09/2022**	**0089_MW496_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.80***	9.30	9.61	88	57	13	146
Fire Training Area	**MW500**	**5/09/2022**	**0089_MW500_220905**	**Normal**	**EP2211343**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***71.1***	75.4	78.3	98	13	<1	23
AVCAT Storage and Fuel Farm	**MW516**	**6/09/2022**	**0089_MW516_220906**	**Normal**	**EP2211389**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.21***	6.88	7.31	138	71	22	172
WWTP (East)	**PW304**	**5/09/2022**	**0089_PW304_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	414	1,160	488	8,790
Helicopter Support Facility	**PW306**	**6/09/2022**	**0089_PW306_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	434	1,390	494	10,800
Helicopter Support Facility	**PW307**	**6/09/2022**	**0089_PW307_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	437	1,420	506	11,000
Helicopter Support Facility	**PW308**	**6/09/2022**	**0089_PW308_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	417	1,350	477	10,500
Helicopter Support Facility	**PW314**	**6/09/2022**	**0089_PW314_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	421	1,360	485	10,600
Helicopter Support Facility	**PW315**	**6/09/2022**	**0089_PW315_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	434	1,400	499	10,900
Helicopter Support Facility	**PW316**	**6/09/2022**	**0089_PW316_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	431	1,380	496	10,800
Demolition Ground	**PW329**	**5/09/2022**	**0089_PW329_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	442	1,420	507	11,000
Demolition Ground	**PW330**	**5/09/2022**	**0089_PW330_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	449	1,450	513	11,200
Demolition Ground	**PW331**	**5/09/2022**	**0089_PW331_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	451	1,410	551	11,000
Demolition Ground	**PW331**	**5/09/2022**	**0089_QC106_220905**	**Field Duplicate**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	441	1,390	573	10,800
Demolition Ground	**PW331**	**5/09/2022**	**0089_QC206_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
Fire Training Area	**PW335**	**5/09/2022**	**0089_PW335_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	414	1,330	589	10,300
Fire Training Area	**PW340**	**5/09/2022**	**0089_PW340_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	439	1,390	618	10,800
Fire Training Area	**PW341**	**5/09/2022**	**0089_PW341_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	424	1,370	611	10,600
WWTP (East)	**PW345**	**5/09/2022**	**0089_PW345_220905**	**Normal**	**EP2211341**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	415	1,350	592	10,500
Accomodation Area	**PW346**	**6/09/2022**	**0089_PW346_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.15***	0.17	0.17	463	1,380	494	10,700
WWTP (West)	**PW350**	**7/09/2022**	**0089_PW350_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	438	1,420	495	11,100
WWTP (West)	**PW351**	**7/09/2022**	**0089_PW351_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	438	1,410	501	10,900
WWTP (West)	**PW352**	**7/09/2022**	**0089_PW352_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	431	1,380	482	10,800
Demolition Ground	**PW356**	**5/09/2022**	**0089_PW356_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	435	1,390	519	10,800
Demolition Ground	**PW357**	**5/09/2022**	**0089_PW357_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	437	1,400	503	10,800

Table B1 - Groundwater, porewater and surface water analytical Results

						PFAS - Perfluoroalkyl Sulfonamides							PFAS			Metals			
						Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1
PFAS NEMP 2020 Drinking Water													*0.07*						
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water													**2**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**														
Demolition Ground	**PW358**	**5/09/2022**	**0089_PW358_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	535	1,430	562	10,900
Fire Training Area	**PW362**	**5/09/2022**	**0089_PW362_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	373	1,200	528	9,330
Fire Training Area	**PW362**	**5/09/2022**	**0089_QC108_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	416	1,330	588	10,400
Fire Training Area	**PW362**	**5/09/2022**	**0089_QC208_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
Fire Training Area	**PW363**	**5/09/2022**	**0089_PW363_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	429	1,370	614	10,600
Fire Training Area	**PW364**	**5/09/2022**	**0089_PW364_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	430	1,380	622	10,700
WWTP (East)	**PW367**	**5/09/2022**	**0089_PW367_220905**	**Normal**	**EP2211341**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	402	1,320	582	10,300
WWTP (East)	**PW367**	**5/09/2022**	**0089_QC110_220905**	**Field Duplicate**	**EP2211341**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	407	1,320	582	10,300
WWTP (East)	**PW367**	**5/09/2022**	**0089_QC210_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
WWTP (East)	**PW368**	**5/09/2022**	**0089_PW368_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	111	171	81	1,270
WWTP (East)	**PW368**	**5/09/2022**	**0089_QC118_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	394	1,100	456	8,290
WWTP (East)	**PW368**	**5/09/2022**	**0089_QC218_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1				
WWTP (East)	**PW369**	**5/09/2022**	**0089_PW369_220905**	**Normal**	**EP2211341**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.11	0.11	428	1,390	618	10,800
Dredge Spoil / Careening Bay	**PW374**	**6/09/2022**	**0089_PW374_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	426	1,380	493	10,700
Dredge Spoil / Careening Bay	**PW375**	**6/09/2022**	**0089_PW375_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	416	1,270	468	9,750
Dredge Spoil / Careening Bay	**PW378**	**6/09/2022**	**0089_PW378_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	441	1,410	502	11,000
WWTP (West)	**PW380**	**7/09/2022**	**0089_PW380_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	426	1,380	484	10,700
WWTP (West)	**PW381**	**7/09/2022**	**0089_PW381_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	421	1,380	487	10,700
WWTP (West)	**PW401**	**7/09/2022**	**0089_PW401_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	429	1,400	492	11,000
Helicopter Support Facility	**PW405**	**7/09/2022**	**0089_PW405_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	434	1,400	487	10,900
Helicopter Support Facility	**PW407**	**7/09/2022**	**0089_PW407_220907**	**Normal**	**EP2211498**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	420	1,360	481	10,600
Helicopter Support Facility	**PW409**	**6/09/2022**	**0089_PW409_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	462	1,460	525	11,400
Helicopter Support Facility	**PW411**	**6/09/2022**	**0089_PW411_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	414	1,330	475	10,300
Helicopter Support Facility	**PW413**	**6/09/2022**	**0089_PW413_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	435	1,370	492	10,600
Helicopter Support Facility	**PW415**	**6/09/2022**	**0089_PW415_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	446	1,420	507	11,000
Fire Training Area	**SW130**	**5/09/2022**	**0089_SW130_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	426	1,380	617	10,800
Fire Training Area	**SW132**	**5/09/2022**	**0089_QC104_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	410	1,320	590	10,300
Fire Training Area	**SW132**	**5/09/2022**	**0089_QC204_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
Fire Training Area	**SW132**	**5/09/2022**	**0089_SW132_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	431	1,400	623	10,900
Fire Training Area	**SW134**	**5/09/2022**	**0089_SW134_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	424	1,380	618	10,800
Demolition Ground	**SW150**	**5/09/2022**	**0089_SW150_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	426	1,370	489	10,600
Demolition Ground	**SW152**	**5/09/2022**	**0089_QC103_220905**	**Field Duplicate**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	430	1,380	495	10,700
Demolition Ground	**SW152**	**5/09/2022**	**0089_QC203_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
Demolition Ground	**SW152**	**5/09/2022**	**0089_SW152_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	424	1,370	484	10,700
Demolition Ground	**SW154**	**5/09/2022**	**0089_SW154_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	435	1,400	498	10,900
Demolition Ground	**SW156**	**5/09/2022**	**0089_SW156_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	434	1,400	500	10,900
WWTP (East)	**SW305**	**5/09/2022**	**0089_QC115_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	378	1,210	528	9,400
WWTP (East)	**SW305**	**5/09/2022**	**0089_QC215_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
WWTP (East)	**SW305**	**5/09/2022**	**0089_SW305_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	386	1,240	544	9,560
Helicopter Support Facility	**SW309**	**6/09/2022**	**0089_SW309_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	432	1,400	500	10,800
Helicopter Support Facility	**SW310**	**6/09/2022**	**0089_SW310_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	421	1,360	483	10,600
Helicopter Support Facility	**SW311**	**6/09/2022**	**0089_SW311_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	444	1,430	506	11,100
Dredge Spoil / Careening Bay	**SW317**	**6/09/2022**	**0089_SW317_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	422	1,360	488	10,600
Dredge Spoil / Careening Bay	**SW318**	**6/09/2022**	**0089_SW318_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	422	1,370	491	10,700
Dredge Spoil / Careening Bay	**SW319**	**6/09/2022**	**0089_SW319_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	426	1,390	494	10,800
WWTP (West)	**SW353**	**7/09/2022**	**0089_SW353_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	442	1,430	500	11,100
WWTP (East)	**SW370**	**5/09/2022**	**0089_SW370_220905**	**Normal**	**EP2211341**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	416	1,350	598	10,500
WWTP (East)	**SW371**	**5/09/2022**	**0089_SW371_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	400	1,260	555	9,730
WWTP (East)	**SW372**	**6/09/2022**	**0089_SW372_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	406	1,300	465	10,100
WWTP (East)	**SW373**	**6/09/2022**	**0089_SW373_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	430	1,380	497	10,700
WWTP (West)	**SW382**	**7/09/2022**	**0089_SW382_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	435	1,420	502	11,100
WWTP (West)	**SW383**	**7/09/2022**	**0089_SW383_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	437	1,420	501	11,000
WWTP (West)	**SW384**	**7/09/2022**	**0089_SW384_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	433	1,410	493	11,000
Helicopter Support Facility	**SW406**	**7/09/2022**	**0089_SW406_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	423	1,370	485	10,700
Helicopter Support Facility	**SW408**	**7/09/2022**	**0089_SW408_220907**	**Normal**	**EP2211498**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	416	1,350	473	10,500
Helicopter Support Facility	**SW410**	**6/09/2022**	**0089_SW410_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	427	1,370	494	10,600
Helicopter Support Facility	**SW412**	**6/09/2022**	**0089_SW412_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	438	1,400	496	10,900
Helicopter Support Facility	**SW414**	**6/09/2022**	**0089_SW414_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	420	1,360	481	10,500
Helicopter Support Facility	**SW416**	**6/09/2022**	**0089_SW416_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	434	1,400	502	10,800

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids			
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01
PFAS NEMP 2020 Drinking Water																*0.56*										
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19										
PFAS NEMP 2020 Recreational Water																**10**										
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**																					
WWTP (East)	**PW304**	**5/09/2022**	**0089_PW304_220905**	**Normal**	**EP2211344**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW306**	**6/09/2022**	**0089_PW306_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW307**	**6/09/2022**	**0089_PW307_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW308**	**6/09/2022**	**0089_PW308_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW314**	**6/09/2022**	**0089_PW314_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW315**	**6/09/2022**	**0089_PW315_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW316**	**6/09/2022**	**0089_PW316_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW329**	**5/09/2022**	**0089_PW329_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW330**	**5/09/2022**	**0089_PW330_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW331**	**5/09/2022**	**0089_PW331_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW331**	**5/09/2022**	**0089_QC106_220905**	**Field Duplicate**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW331**	**5/09/2022**	**0089_QC206_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
Fire Training Area	**PW335**	**5/09/2022**	**0089_PW335_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW340**	**5/09/2022**	**0089_PW340_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW341**	**5/09/2022**	**0089_PW341_220905**	**Normal**	**EP2211344**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW345**	**5/09/2022**	**0089_PW345_220905**	**Normal**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Accomodation Area	**PW346**	**6/09/2022**	**0089_PW346_220906**	**Normal**	**EP2211391**	<0.02	<0.02	0.04	<0.02	0.11	<0.02	<0.1	0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW350**	**7/09/2022**	**0089_PW350_220907**	**Normal**	**EP2211496**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW351**	**7/09/2022**	**0089_PW351_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW352**	**7/09/2022**	**0089_PW352_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW356**	**5/09/2022**	**0089_PW356_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW357**	**5/09/2022**	**0089_PW357_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition Ground	**PW358**	**5/09/2022**	**0089_PW358_220905**	**Normal**	**EP2211347**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW362**	**5/09/2022**	**0089_PW362_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW362**	**5/09/2022**	**0089_QC108_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW362**	**5/09/2022**	**0089_QC208_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
Fire Training Area	**PW363**	**5/09/2022**	**0089_PW363_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	**PW364**	**5/09/2022**	**0089_PW364_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW367**	**5/09/2022**	**0089_PW367_220905**	**Normal**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW367**	**5/09/2022**	**0089_QC110_220905**	**Field Duplicate**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW367**	**5/09/2022**	**0089_QC210_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
WWTP (East)	**PW368**	**5/09/2022**	**0089_PW368_220905**	**Normal**	**EP2211344**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW368**	**5/09/2022**	**0089_QC118_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (East)	**PW368**	**5/09/2022**	**0089_QC218_220905**	**Interlab Duplicate**	**920981**	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
WWTP (East)	**PW369**	**5/09/2022**	**0089_PW369_220905**	**Normal**	**EP2211341**	<0.02	<0.02	<0.01	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW374**	**6/09/2022**	**0089_PW374_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW375**	**6/09/2022**	**0089_PW375_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Dredge Spoil / Careening Bay	**PW378**	**6/09/2022**	**0089_PW378_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW380**	**7/09/2022**	**0089_PW380_220907**	**Normal**	**EP2211496**	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW381**	**7/09/2022**	**0089_PW381_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
WWTP (West)	**PW401**	**7/09/2022**	**0089_PW401_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW405**	**7/09/2022**	**0089_PW405_220907**	**Normal**	**EP2211496**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW407**	**7/09/2022**	**0089_PW407_220907**	**Normal**	**EP2211498**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW409**	**6/09/2022**	**0089_PW409_220906**	**Normal**	**EP2211391**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW411**	**6/09/2022**	**0089_PW411_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW413**	**6/09/2022**	**0089_PW413_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Helicopter Support Facility	**PW415**	**6/09/2022**	**0089_PW415_220906**	**Normal**	**EP2211401**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

Cardno now Stantec

Table B1 - Groundwater, porewater and surface water analytical Results

PFAS OMP
Q3 2022
HMAS Stirling

						PFAS - Perfluoroalkyl Sulfonamides							PFAS			Metals			
						Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1
PFAS NEMP 2020 Drinking Water													*0.07*						
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water													**2**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**														
WWTP (East)	**PW304**	**5/09/2022**	**0089_PW304_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	414	1,160	488	8,790
Helicopter Support Facility	**PW306**	**6/09/2022**	**0089_PW306_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	434	1,390	494	10,800
Helicopter Support Facility	**PW307**	**6/09/2022**	**0089_PW307_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	437	1,420	506	11,000
Helicopter Support Facility	**PW308**	**6/09/2022**	**0089_PW308_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	417	1,350	477	10,500
Helicopter Support Facility	**PW314**	**6/09/2022**	**0089_PW314_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	421	1,360	485	10,600
Helicopter Support Facility	**PW315**	**6/09/2022**	**0089_PW315_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	434	1,400	499	10,900
Helicopter Support Facility	**PW316**	**6/09/2022**	**0089_PW316_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	431	1,380	496	10,800
Demolition Ground	**PW329**	**5/09/2022**	**0089_PW329_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	442	1,420	507	11,000
Demolition Ground	**PW330**	**5/09/2022**	**0089_PW330_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	449	1,450	513	11,200
Demolition Ground	**PW331**	**5/09/2022**	**0089_PW331_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	451	1,410	551	11,000
Demolition Ground	**PW331**	**5/09/2022**	**0089_QC106_220905**	**Field Duplicate**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	441	1,390	573	10,800
Demolition Ground	**PW331**	**5/09/2022**	**0089_QC206_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
Fire Training Area	**PW335**	**5/09/2022**	**0089_PW335_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	414	1,330	589	10,300
Fire Training Area	**PW340**	**5/09/2022**	**0089_PW340_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	439	1,390	618	10,800
Fire Training Area	**PW341**	**5/09/2022**	**0089_PW341_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	424	1,370	611	10,600
WWTP (East)	**PW345**	**5/09/2022**	**0089_PW345_220905**	**Normal**	**EP2211341**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	415	1,350	592	10,500
Accomodation Area	**PW346**	**6/09/2022**	**0089_PW346_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	0.17	0.17	463	1,380	494	10,700
WWTP (West)	**PW350**	**7/09/2022**	**0089_PW350_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	438	1,420	495	11,100
WWTP (West)	**PW351**	**7/09/2022**	**0089_PW351_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	438	1,410	501	10,900
WWTP (West)	**PW352**	**7/09/2022**	**0089_PW352_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	431	1,380	482	10,800
Demolition Ground	**PW356**	**5/09/2022**	**0089_PW356_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	435	1,390	519	10,800
Demolition Ground	**PW357**	**5/09/2022**	**0089_PW357_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	437	1,400	503	10,800
Demolition Ground	**PW358**	**5/09/2022**	**0089_PW358_220905**	**Normal**	**EP2211347**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	535	1,430	562	10,900
Fire Training Area	**PW362**	**5/09/2022**	**0089_PW362_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	373	1,200	528	9,330
Fire Training Area	**PW362**	**5/09/2022**	**0089_QC108_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	416	1,330	588	10,400
Fire Training Area	**PW362**	**5/09/2022**	**0089_QC208_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
Fire Training Area	**PW363**	**5/09/2022**	**0089_PW363_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	429	1,370	614	10,600
Fire Training Area	**PW364**	**5/09/2022**	**0089_PW364_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	430	1,380	622	10,700
WWTP (East)	**PW367**	**5/09/2022**	**0089_PW367_220905**	**Normal**	**EP2211341**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	402	1,320	582	10,300
WWTP (East)	**PW367**	**5/09/2022**	**0089_QC110_220905**	**Field Duplicate**	**EP2211341**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	407	1,320	582	10,300
WWTP (East)	**PW367**	**5/09/2022**	**0089_QC210_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1				
WWTP (East)	**PW368**	**5/09/2022**	**0089_PW368_220905**	**Normal**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	111	171	81	1,270
WWTP (East)	**PW368**	**5/09/2022**	**0089_QC118_220905**	**Field Duplicate**	**EP2211344**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	394	1,100	456	8,290
WWTP (East)	**PW368**	**5/09/2022**	**0089_QC218_220905**	**Interlab Duplicate**	**920981**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1				
WWTP (East)	**PW369**	**5/09/2022**	**0089_PW369_220905**	**Normal**	**EP2211341**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.11	0.11	428	1,390	618	10,800
Dredge Spoil / Careening Bay	**PW374**	**6/09/2022**	**0089_PW374_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	426	1,380	493	10,700
Dredge Spoil / Careening Bay	**PW375**	**6/09/2022**	**0089_PW375_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	416	1,270	468	9,750
Dredge Spoil / Careening Bay	**PW378**	**6/09/2022**	**0089_PW378_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	441	1,410	502	11,000
WWTP (West)	**PW380**	**7/09/2022**	**0089_PW380_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	426	1,380	484	10,700
WWTP (West)	**PW381**	**7/09/2022**	**0089_PW381_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	421	1,380	487	10,700
WWTP (West)	**PW401**	**7/09/2022**	**0089_PW401_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	429	1,400	492	11,000
Helicopter Support Facility	**PW405**	**7/09/2022**	**0089_PW405_220907**	**Normal**	**EP2211496**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	434	1,400	487	10,900
Helicopter Support Facility	**PW407**	**7/09/2022**	**0089_PW407_220907**	**Normal**	**EP2211498**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	420	1,360	481	10,600
Helicopter Support Facility	**PW409**	**6/09/2022**	**0089_PW409_220906**	**Normal**	**EP2211391**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	462	1,460	525	11,400
Helicopter Support Facility	**PW411**	**6/09/2022**	**0089_PW411_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	414	1,330	475	10,300
Helicopter Support Facility	**PW413**	**6/09/2022**	**0089_PW413_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	435	1,370	492	10,600
Helicopter Support Facility	**PW415**	**6/09/2022**	**0089_PW415_220906**	**Normal**	**EP2211401**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	446	1,420	507	11,000

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:
First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

Cardno now Stantec

Table B2 - Sediment analytical results

PFAS OMP
Q3 2022
HMAS Stirling

								PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids			
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting							0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005
PFAS NEMP 2020 Ecological direct exposure											1						10										
PFAS NEMP 2020 Ecological indirect exposure											*0.01*																
PFAS NEMP 2020 Industrial/ commercial (HIL D)																	**50**										
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																						
WWTP	**SD304**	**5/09/2022**	**0089_SD304_220905**	**Normal**	**EP2211346**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD306**	**6/09/2022**	**0089_SD306_220906**	**Normal**	**EP2211402**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD307**	**6/09/2022**	**0089_SD307_220906**	**Normal**	**EP2211402**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD308**	**6/09/2022**	**0089_SD308_220906**	**Normal**	**EP2211402**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD314**	**6/09/2022**	**0089_SD314_220906**	**Normal**	**EP2211402**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD315**	**6/09/2022**	**0089_SD315_220906**	**Normal**	**EP2211402**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD316**	**6/09/2022**	**0089_SD316_220906**	**Normal**	**EP2211402**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Demolition ground	**SD329**	**5/09/2022**	**0089_SD329_220905**	**Normal**	**EP2211348**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Demolition ground	**SD330**	**5/09/2022**	**0089_SD330_220905**	**Normal**	**EP2211348**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Demolition ground	**SD331**	**5/09/2022**	**0089_SD331_220905**	**Normal**	**EP2211348**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fire Training Area	**SD335**	**5/09/2022**	**0089_SD335_220905**	**Normal**	**EP2211346**		<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fire Training Area	**SD340**	**5/09/2022**	**0089_QC105_220905**	**Field Duplicate**	**EP2211346**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fire Training Area	**SD340**	**5/09/2022**	**0089_QC205_220905**	**Interlab Duplicate**	**920981**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
Fire Training Area	**SD340**	**5/09/2022**	**0089_SD340_220905**	**Normal**	**EP2211346**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fire Training Area	**SD341**	**5/09/2022**	**0089_SD341_220905**	**Normal**	**EP2211346**		<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD345**	**5/09/2022**	**0089_SD345_220905**	**Normal**	**EP2211342**		<0.0002	<0.0002	<0.0002	<0.0002	0.0016	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Accomodation Area	**SD346**	**6/09/2022**	**0089_SD346_220906**	**Normal**	**EP2211393**		<0.0002	<0.0002	<0.0002	<0.0002	0.0025	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD350**	**7/09/2022**	**0089_SD350_220907**	**Normal**	**EP2211497**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD351**	**7/09/2022**	**0089_SD351_220907**	**Normal**	**EP2211499**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD352**	**7/09/2022**	**0089_SD352_220907**	**Normal**	**EP2211499**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Demolition ground	**SD356**	**5/09/2022**	**0089_SD356_220905**	**Normal**	**EP2211348**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Demolition ground	**SD357**	**5/09/2022**	**0089_QC107_220905**	**Field Duplicate**	**EP2211348**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Demolition ground	**SD357**	**5/09/2022**	**0089_QC207_220905**	**Interlab Duplicate**	**920981**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
Demolition ground	**SD357**	**5/09/2022**	**0089_SD357_220905**	**Normal**	**EP2211348**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Demolition ground	**SD358**	**5/09/2022**	**0089_SD358_220905**	**Normal**	**EP2211348**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fire Training	**SD362**	**5/09/2022**	**0089_SD362_220905**	**Normal**	**EP2211346**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fire Training	**SD363**	**5/09/2022**	**0089_QC112_220905**	**Field Duplicate**	**EP2211342**		<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fire Training	**SD363**	**5/09/2022**	**0089_QC212_220905**	**Interlab Duplicate**	**920981**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
Fire Training	**SD363**	**5/09/2022**	**0089_SD363_220905**	**Normal**	**EP2211346**		<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fire Training	**SD364**	**5/09/2022**	**0089_SD364_220905**	**Normal**	**EP2211346**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD367**	**5/09/2022**	**0089_QC109_220905**	**Field Duplicate**	**EP2211342**		<0.0002	<0.0002	<0.0002	<0.0002	0.0011	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD367**	**5/09/2022**	**0089_QC209_220905**	**Interlab Duplicate**	**920981**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
WWTP	**SD367**	**5/09/2022**	**0089_SD367_220905**	**Normal**	**EP2211342**		<0.0002	<0.0002	<0.0002	<0.0002	0.0011	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD368**	**5/09/2022**	**0089_SD368_220905**	**Normal**	**EP2211346**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD369**	**5/09/2022**	**0089_SD369_220905**	**Normal**	**EP2211342**		<0.0002	<0.0002	<0.0002	<0.0002	0.0020	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dredge spoil and careening bay	**SD374**	**6/09/2022**	**0089_SD374_220906**	**Normal**	**EP2211393**		<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dredge spoil and careening bay	**SD375**	**6/09/2022**	**0089_SD375_220906**	**Normal**	**EP2211393**		<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dredge spoil and careening bay	**SD378**	**6/09/2022**	**0089_SD378_220906**	**Normal**	**EP2211393**		<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD380**	**7/09/2022**	**0089_SD380_220907**	**Normal**	**EP2211499**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD381**	**7/09/2022**	**0089_SD381_220907**	**Normal**	**EP2211499**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
WWTP	**SD401**	**7/09/2022**	**0089_SD401_220907**	**Normal**	**EP2211499**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD405**	**7/09/2022**	**0089_SD405_220907**	**Normal**	**EP2211497**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD407**	**7/09/2022**	**0089_SD407_220907**	**Normal**	**EP2211499**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD409**	**6/09/2022**	**0089_SD409_220906**	**Normal**	**EP2211393**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD411**	**6/09/2022**	**0089_SD411_220906**	**Normal**	**EP2211402**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD413**	**6/09/2022**	**0089_SD413_220906**	**Normal**	**EP2211402**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Helicopter support area	**SD415**	**6/09/2022**	**0089_SD415_220906**	**Normal**	**EP2211402**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:

First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

Cardno now Stantec

Table B2 - Sediment analytical results

PFAS OMP
Q3 2022
HMAS Stirling

	PFAS - Perfluoroalkyl Sulfonamides							PFAS		
	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
PFAS NEMP 2020 Ecological direct exposure										
PFAS NEMP 2020 Ecological indirect exposure										
PFAS NEMP 2020 Industrial/ commercial (HIL D)								**20**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**					
WWTP	**SD304**	**5/09/2022**	**0089_SD304_220905**	**Normal**	**EP2211346**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD306**	**6/09/2022**	**0089_SD306_220906**	**Normal**	**EP2211402**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD307**	**6/09/2022**	**0089_SD307_220906**	**Normal**	**EP2211402**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD308**	**6/09/2022**	**0089_SD308_220906**	**Normal**	**EP2211402**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD314**	**6/09/2022**	**0089_SD314_220906**	**Normal**	**EP2211402**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD315**	**6/09/2022**	**0089_SD315_220906**	**Normal**	**EP2211402**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD316**	**6/09/2022**	**0089_SD316_220906**	**Normal**	**EP2211402**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD329**	**5/09/2022**	**0089_SD329_220905**	**Normal**	**EP2211348**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD330**	**5/09/2022**	**0089_SD330_220905**	**Normal**	**EP2211348**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD331**	**5/09/2022**	**0089_SD331_220905**	**Normal**	**EP2211348**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD335**	**5/09/2022**	**0089_SD335_220905**	**Normal**	**EP2211346**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Fire Training Area	**SD340**	**5/09/2022**	**0089_QC105_220905**	**Field Duplicate**	**EP2211346**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD340**	**5/09/2022**	**0089_QC205_220905**	**Interlab Duplicate**	**920981**	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Fire Training Area	**SD340**	**5/09/2022**	**0089_SD340_220905**	**Normal**	**EP2211346**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	**SD341**	**5/09/2022**	**0089_SD341_220905**	**Normal**	**EP2211346**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	**SD345**	**5/09/2022**	**0089_SD345_220905**	**Normal**	**EP2211342**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0016	0.0016	0.0016
Accomodation Area	**SD346**	**6/09/2022**	**0089_SD346_220906**	**Normal**	**EP2211393**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0025	0.0025	0.0025
WWTP	**SD350**	**7/09/2022**	**0089_SD350_220907**	**Normal**	**EP2211497**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**7/09/2022**	**0089_SD351_220907**	**Normal**	**EP2211499**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**7/09/2022**	**0089_SD352_220907**	**Normal**	**EP2211499**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD356**	**5/09/2022**	**0089_SD356_220905**	**Normal**	**EP2211348**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD357**	**5/09/2022**	**0089_QC107_220905**	**Field Duplicate**	**EP2211348**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD357**	**5/09/2022**	**0089_QC207_220905**	**Interlab Duplicate**	**920981**	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition ground	**SD357**	**5/09/2022**	**0089_SD357_220905**	**Normal**	**EP2211348**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD358**	**5/09/2022**	**0089_SD358_220905**	**Normal**	**EP2211348**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training	**SD362**	**5/09/2022**	**0089_SD362_220905**	**Normal**	**EP2211346**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training	**SD363**	**5/09/2022**	**0089_QC112_220905**	**Field Duplicate**	**EP2211342**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Fire Training	**SD363**	**5/09/2022**	**0089_QC212_220905**	**Interlab Duplicate**	**920981**	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Fire Training	**SD363**	**5/09/2022**	**0089_SD363_220905**	**Normal**	**EP2211346**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
Fire Training	**SD364**	**5/09/2022**	**0089_SD364_220905**	**Normal**	**EP2211346**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD367**	**5/09/2022**	**0089_QC109_220905**	**Field Duplicate**	**EP2211342**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0011	0.0011	0.0011
WWTP	**SD367**	**5/09/2022**	**0089_QC209_220905**	**Interlab Duplicate**	**920981**	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	**SD367**	**5/09/2022**	**0089_SD367_220905**	**Normal**	**EP2211342**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0011	0.0011	0.0011
WWTP	**SD368**	**5/09/2022**	**0089_SD368_220905**	**Normal**	**EP2211346**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD369**	**5/09/2022**	**0089_SD369_220905**	**Normal**	**EP2211342**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0020	0.0020	0.0020
Dredge spoil and careening bay	**SD374**	**6/09/2022**	**0089_SD374_220906**	**Normal**	**EP2211393**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
Dredge spoil and careening bay	**SD375**	**6/09/2022**	**0089_SD375_220906**	**Normal**	**EP2211393**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Dredge spoil and careening bay	**SD378**	**6/09/2022**	**0089_SD378_220906**	**Normal**	**EP2211393**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD380**	**7/09/2022**	**0089_SD380_220907**	**Normal**	**EP2211499**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD381**	**7/09/2022**	**0089_SD381_220907**	**Normal**	**EP2211499**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD401**	**7/09/2022**	**0089_SD401_220907**	**Normal**	**EP2211499**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD405**	**7/09/2022**	**0089_SD405_220907**	**Normal**	**EP2211497**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD407**	**7/09/2022**	**0089_SD407_220907**	**Normal**	**EP2211499**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD409**	**6/09/2022**	**0089_SD409_220906**	**Normal**	**EP2211393**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD411**	**6/09/2022**	**0089_SD411_220906**	**Normal**	**EP2211402**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD413**	**6/09/2022**	**0089_SD413_220906**	**Normal**	**EP2211402**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter support area	**SD415**	**6/09/2022**	**0089_SD415_220906**	**Normal**	**EP2211402**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure
HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D)

Notes:

First Time detect of PFOA or PFHxS+PFOS
New exceedance of guideline value

Table B3 - Rinsates and blanks analytical results

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorote	
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
PFAS NEMP 2020 Drinking Water											*0.56*								
PFAS NEMP 2020 Interim Marine 99%					0.00023						19								
PFAS NEMP 2020 Recreational Water											**10**								
Date	**Field ID**	**Sample Type**	**Lab Report**																
5/09/2022	**0089_QC301_220905**	**Rinsate**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
5/09/2022	**0089_QC302_220905**	**Rinsate**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
5/09/2022	**0089_QC303_220905**	**Rinsate**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
5/09/2022	**0089_QC401_220905**	**Field Blank**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
5/09/2022	**0089_QC402_220905**	**Field Blank**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
5/09/2022	**0089_QC403_220905**	**Field Blank**	**EP2211343**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
6/09/2022	**0089_QC301_220906**	**Rinsate**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
6/09/2022	**0089_QC302_220906**	**Rinsate**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
6/09/2022	**0089_QC303_220906**	**Rinsate**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
6/09/2022	**0089_QC401_220906**	**Field Blank**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
6/09/2022	**0089_QC402_220906**	**Field Blank**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
6/09/2022	**0089_QC403_220906**	**Field Blank**	**EP2211389**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
7/09/2022	**0089_QC301_220907**	**Rinsate**	**EP2211611**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.10	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
7/09/2022	**0089_QC302_220907**	**Rinsate**	**EP2211611**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.10	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
7/09/2022	**0089_QC401_220907**	**Field Blank**	**EP2211611**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.10	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
7/09/2022	**0089_QC402_220907**	**Field Blank**	**EP2211611**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.10	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
8/09/2022	**0089_QC301_220908**	**Rinsate**	**EP2211535**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
8/09/2022	**0089_QC401_220908**	**Field Blank**	**EP2211535**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Table B3 - Rinsates and blanks analytical results

				Fluorotelomer Sulfonic Acids		PFAS - Perfluoroalkyl Sulfonamides							PFAS		
				8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water													*0.07*		
PFAS NEMP 2020 Interim Marine 99%															
PFAS NEMP 2020 Recreational Water													**2**		
Date	**Field ID**	**Sample Type**	**Lab Report**												
5/09/2022	**0089_QC301_220905**	**Rinsate**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
5/09/2022	**0089_QC302_220905**	**Rinsate**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
5/09/2022	**0089_QC303_220905**	**Rinsate**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
5/09/2022	**0089_QC401_220905**	**Field Blank**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
5/09/2022	**0089_QC402_220905**	**Field Blank**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
5/09/2022	**0089_QC403_220905**	**Field Blank**	**EP2211343**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
6/09/2022	**0089_QC301_220906**	**Rinsate**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
6/09/2022	**0089_QC302_220906**	**Rinsate**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
6/09/2022	**0089_QC303_220906**	**Rinsate**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
6/09/2022	**0089_QC401_220906**	**Field Blank**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
6/09/2022	**0089_QC402_220906**	**Field Blank**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
6/09/2022	**0089_QC403_220906**	**Field Blank**	**EP2211389**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
7/09/2022	**0089_QC301_220907**	**Rinsate**	**EP2211611**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
7/09/2022	**0089_QC302_220907**	**Rinsate**	**EP2211611**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
7/09/2022	**0089_QC401_220907**	**Field Blank**	**EP2211611**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
7/09/2022	**0089_QC402_220907**	**Field Blank**	**EP2211611**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
8/09/2022	**0089_QC301_220908**	**Rinsate**	**EP2211535**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
8/09/2022	**0089_QC401_220908**	**Field Blank**	**EP2211535**	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

	Date		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022	
	Field ID		0089_MW124_220905	0089_QC102_220905		0089_MW124_220905	0089_QC202_220905		0089_MW141_220905	0089_QC101_220905		0089_MW141_220905	0089_QC201_220905	
	Matrix Type		Water	Water		Water	Water		Water	Water		Water	Water	
	Lab Report Number		EP2211345	EP2211345	RPD	EP2211345	920981	RPD	EP2211343	EP2211343	RPD	EP2211343	920981	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01					<0.01						0.21	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.58	0.52	11	0.58	0.49	17
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	1.94	1.75	10	1.94	0.96	**68**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	29.2	27.3	7	29.2	22	**28**
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	2.35	2.08	12	2.35	1.2	**65**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	0.02	67	102	102	0	102	60	**52**
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	0.3	0.3	0	0.3	0.23	26
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	1.30	1.29	1	1.30	1.1	17
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	13.4	13.0	3	13.4	4.6	**98**
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.54	0.50	8	0.54	0.36	**40**
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	2.86	2.68	6	2.86	1.8	**45**
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.05	0.04	22	0.05	0.03	50
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS														
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	0.02	67	131	129	2	131	82	**46**
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	150	148	1	150	90.58	**49**
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	154	151	2	154	92.98	**49**

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

		Date	5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022	
		Field ID	0089_SW132_220905	0089_QC104_220905		0089_SW132_220905	0089_QC204_220905		0089_SW152_220905	0089_QC103_220905		0089_SW152_220905	0089_QC203_220905		0089_PW362_220905	0089_QC108_220905	
		Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
		Lab Report Number	EP2211344	EP2211344	RPD	EP2211344	920981	RPD	EP2211347	EP2211347	RPD	EP2211347	920981	RPD	EP2211344	EP2211344	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01					<0.01						<0.01				
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01				
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0

Date			5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022	
Field ID			0089_PW362_220905	0089_QC208_220905		0089_PW367_220905	0089_QC110_220905		0089_PW367_220905	0089_QC210_220905		0089_PW331_220905	0089_QC106_220905		0089_PW331_220905	0089_QC206_220905	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2211344	920981	RPD	EP2211341	EP2211341	RPD	EP2211341	920981	RPD	EP2211347	EP2211347	RPD	EP2211347	920981	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01		<0.01						<0.01						<0.01	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	0.01	<0.01	0	0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01		<0.01						<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	0.01	<0.01	0	0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.05	0	0.01	<0.01	0	0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.01	<0.01	<0.1	0	0.01	<0.01	0	0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0

Date			5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022	
Field ID			0089_MW199_220905	0089_QC111_220905		0089_MW199_220905	0089_QC211_220905		0089_MW127_220905	0089_QC113_220905		0089_MW127_220905	0089_QC213_220905		0089_PW368_220905	0089_QC118_220905	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2211340	EP2211340	RPD	EP2211340	920981	RPD	EP2211345	EP2211345	RPD	EP2211345	920981	RPD	EP2211344	EP2211344	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01					<0.01						<0.01				
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	0.02	67
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01				
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	0.03	100
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	0.03	100
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	0.03	100

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Table B4 - Groundwater, porewater and surface water RPDs

PFAS OMP
Q3 2022
HMAS Stirling

Date			5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022	
Field ID			0089_PW368_220905	0089_QC218_220905		0089_SW305_220905	0089_QC115_220905		0089_SW305_220905	0089_QC215_220905		0089_MW123_220905	0089_QC114_220905		0089_MW123_220905	0089_QC214_220905	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2211344	920981	RPD	EP2211344	EP2211344	RPD	EP2211344	920981	RPD	EP2211343	EP2211343	RPD	EP2211343	920981	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01		<0.01						<0.01						0.02	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.10	0.13	26	0.10	0.07	35
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.10	0.13	26	0.10	0.06	50
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.24	0.41	**52**	0.24	0.19	**23**
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	0.04	0.04	0	0.04	0.02	67
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01		<0.01						<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.04	0.06	40	0.04	0.03	29
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	0.19	0.26	31	0.19	0.10	62
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	0.02	67	<0.01	<0.01	0	<0.01	<0.01	0	0.28	0.45	**47**	0.28	0.21	**29**
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0	0.61	0.90	**38**	0.61	0.41	**39**
Sum of PFAS	µg/L	0.01	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	0.71	1.03	**37**	0.71	0.49	**37**

Table B4 - Groundwater, porewater and surface water RPDs

Date			5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022	
Field ID			0089_MW120_220905	0089_QC116_220905		0089_MW120_220905	0089_QC216_220905		0089_MW109_220905	0089_QC117_220905		0089_MW109_220905	0089_QC217_220905	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2211343	EP2211343	RPD	EP2211343	920981	RPD	EP2211343	EP2211343	RPD	EP2211343	920981	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01					<0.01						0.01	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.03	0.02	40	0.03	0.02	40	0.06	0.06	0	0.06	0.06	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.07	0.08	13	0.07	0.11	44	0.14	0.14	0	0.14	0.09	43
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	22.2	21.5	3	22.2	17	**27**	0.53	0.53	0	0.53	0.32	**49**
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	3.67	3.54	4	3.67	2.1	**54**	<0.02	<0.02	0	<0.02	0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.36	0.33	9	0.36	0.28	**25**	0.08	0.09	12	0.08	0.07	13
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.11	0.12	9	0.11	0.07	44	0.09	0.08	12	0.09	0.05	57
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	2.00	2.00	0	2.00	1.4	**35**	0.01	0.02	67	0.01	0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS														
Sum of PFHxS and PFOS	µg/L	0.01	22.6	21.8	4	22.6	17.28	**27**	0.61	0.62	2	0.61	0.39	**44**
Sum of PFAS (WA DER List)	µg/L	0.01	24.7	24.0	3	24.7	18.79	**27**	0.77	0.78	1	0.77	0.51	**41**
Sum of PFAS	µg/L	0.01	28.4	27.6	3	28.4	21	**30**	0.91	0.92	1	0.91	0.62	**38**

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Table B5 - Sediment RPDs

PFAS OMP
Q3 2022
HMAS Stirling

			Date	5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022
			Field ID	0089_SD340_220905	0089_QC105_220905		0089_SD340_220905	0089_QC205_220905		0089_SD367_220905	0089_QC109_220905		0089_SD367_220905	0089_QC209_220905		0089_SD357_220905
			Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil
			Lab Report Number	EP2211346	EP2211346	RPD	EP2211346	920981	RPD	EP2211342	EP2211342	RPD	EP2211342	920981	RPD	EP2211348
	Unit	LOR														
PFAS - Perfluoroalkyl Sulfonic Acids																
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	0.0011	0.0011	0	0.0011	<0.005	0	<0.0002
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
PFAS - Perfluoroalkyl Carboxylic Acids																
Perfluorobutanoic acid (PFBA)	mg/kg	0.001		<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0	<0.001
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluorononanoic acid (PFNA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005
PFAS - (n:2) Fluorotelomer Sulfonic Acids																
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005
PFAS - Perfluoroalkyl Sulfonamides																
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005
PFAS																
Sum of PFHxS and PFOS	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	0.0011	0.0011	0	0.0011	<0.005	0	<0.0002
Sum of PFAS (WA DER List)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	0.0011	0.0011	0	0.0011	<0.01	0	<0.0002
Sum of PFAS	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.05	0	0.0011	0.0011	0	0.0011	<0.05	0	<0.0002

***RPDs have only been considered where a concentration is greater than 1 times the LOR.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

			Date	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022		5/09/2022	5/09/2022	
			Field ID	0089_QC107_220905		0089_SD357_220905	0089_QC207_220905		0089_SD363_220905	0089_QC112_220905		0089_SD363_220905	0089_QC212_220905	
			Matrix Type	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
			Lab Report Number	EP2211348	RPD	EP2211348	920981	RPD	EP2211346	EP2211342	RPD	EP2211346	920981	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	0.0005	0.0004	22	0.0005	<0.005	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.001		<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005		<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005		<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005		<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005		<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005		<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005		<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005		<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005		<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005		<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS														
Sum of PFHxS and PFOS	mg/kg	0.0002		<0.0002	0	<0.0002	<0.005	0	0.0005	0.0004	22	0.0005	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002		<0.0002	0	<0.0002	<0.01	0	0.0005	0.0004	22	0.0005	<0.01	0
Sum of PFAS	mg/kg	0.0002		<0.0002	0	<0.0002	<0.05	0	0.0005	0.0004	22	0.0005	<0.05	0

APPENDIX

C

LABORATORY CERTIFICATES

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Stantec

CHAIN OF CUSTODY

COC#: 41979 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW197		05/09/2022 09:28 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra PFAS Lab QAQC
002	0089_MW200		05/09/2022 09:55 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra PFAS Lab QAQC
003	0089_MW199		05/09/2022 11:04 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
004	0089_QC111		05/09/2022 11:15 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_MW171		05/09/2022 11:49 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
006	0089_MW158		05/09/2022 12:48 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
007	0089_MW166		05/09/2022 01:03 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
008	0089_MW161		05/09/2022 01:05 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
009	0089_MW195D		05/09/2022 01:31 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS

CHAIN OF CUSTODY

COC#: **41979** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW195S		05/09/2022 01:40 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
011	0089_MW193		05/09/2022 02:00 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
012	0089_MW173		05/09/2022 02:32 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
013	0089_MW216		05/09/2022 02:47 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS

CHAIN OF CUSTODY

ALS COC#: 41979 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW197	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW200	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW199	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_QC111	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW171	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW158	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW166	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW161	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW195D	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **41979** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_MW195S	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW193	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW173	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_MW216	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **41979** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO:

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen Ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW197	Clear Plastic Bottle - Natural	500 mL	0070821057207	Green	No	
001	0089_MW197	HDPE (no PTFE)	20 mL	0035082101 3078	Grey	No	
001	0089_MW197	HDPE (no PTFE)	20 mL	0035082101 2954	Grey	No	
001	0089_MW197	HDPE (no PTFE)	20 mL	0035082101 2927	Grey	No	
001	0089_MW197	HDPE (no PTFE)	20 mL	0035082101 3010	Grey	No	
002	0089_MW200	Clear Plastic Bottle - Natural	500 mL	0070821041331	Green	No	
002	0089_MW200	HDPE (no PTFE)	20 mL	0035082101 2852	Grey	No	
002	0089_MW200	HDPE (no PTFE)	20 mL	0035082101 2899	Grey	No	
002	0089_MW200	HDPE (no PTFE)	20 mL	0035082101 3027	Grey	No	
002	0089_MW200	HDPE (no PTFE)	20 mL	0035082101 2910	Grey	No	
003	0089_MW199	Clear Plastic Bottle - Natural	500 mL	0070821057237	Green	No	
003	0089_MW199	HDPE (no PTFE)	20 mL	0035082101 2913	Grey	No	
003	0089_MW199	HDPE (no PTFE)	20 mL	0035082101 3038	Grey	No	
003	0089_MW199	HDPE (no PTFE)	20 mL	0035082101 2916	Grey	No	
003	0089_MW199	HDPE (no PTFE)	20 mL	0035082101 3069	Grey	No	
004	0089_QC111	HDPE (no PTFE)	20 mL	0035082101 2782	Grey	No	
004	0089_QC111	HDPE (no PTFE)	20 mL	0035082101 2868	Grey	No	
004	0089_QC111	Clear Plastic Bottle - Natural	500 mL	0070821039547	Green	No	
005	0089_MW171	HDPE (no PTFE)	20 mL	0035082101 3031	Grey	No	
005	0089_MW171	HDPE (no PTFE)	20 mL	0035082101 2815	Grey	No	
005	0089_MW171	HDPE (no PTFE)	20 mL	0035082101 2906	Grey	No	
005	0089_MW171	HDPE (no PTFE)	20 mL	0035082101 2917	Grey	No	
005	0089_MW171	Clear Plastic Bottle - Natural	500 mL	0070821057220	Green	No	
006	0089_MW158	Clear Plastic Bottle - Natural	500 mL	0070821057250	Green	No	
006	0089_MW158	HDPE (no PTFE)	20 mL	0035082101 3011	Grey	No	
006	0089_MW158	HDPE (no PTFE)	20 mL	0035082101 2784	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 41979 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

006	0089_MW158	HDPE (no PTFE)	20 mL	00350821012979	Grey	No	
006	0089_MW158	HDPE (no PTFE)	20 mL	00350821012804	Grey	No	
007	0089_MW166	Clear Plastic Bottle - Natural	500 mL	00070821057247	Green	No	
007	0089_MW166	HDPE (no PTFE)	20 mL	00350821012860	Grey	No	
007	0089_MW166	HDPE (no PTFE)	20 mL	00350821012912	Grey	No	
007	0089_MW166	HDPE (no PTFE)	20 mL	00350821013044	Grey	No	
007	0089_MW166	HDPE (no PTFE)	20 mL	00350821013061	Grey	No	
008	0089_MW161	Clear Plastic Bottle - Natural	500 mL	00070821057216	Green	No	
008	0089_MW161	HDPE (no PTFE)	20 mL	00350821012816	Grey	No	
008	0089_MW161	HDPE (no PTFE)	20 mL	00350821012959	Grey	No	
008	0089_MW161	HDPE (no PTFE)	20 mL	00350821013020	Grey	No	
008	0089_MW161	HDPE (no PTFE)	20 mL	00350821012863	Grey	No	
009	0089_MW195D	HDPE (no PTFE)	20 mL	00350821012892	Grey	No	
009	0089_MW195D	Clear Plastic Bottle - Natural	500 mL	00070821057223	Green	No	
009	0089_MW195D	HDPE (no PTFE)	20 mL	00350821012831	Grey	No	
009	0089_MW195D	HDPE (no PTFE)	20 mL	00350821012840	Grey	No	
009	0089_MW195D	HDPE (no PTFE)	20 mL	00350821013017	Grey	No	
010	0089_MW195S	Clear Plastic Bottle - Natural	500 mL	00070821057205	Green	No	
010	0089_MW195S	HDPE (no PTFE)	20 mL	00350821012962	Grey	No	
010	0089_MW195S	HDPE (no PTFE)	20 mL	00350821012827	Grey	No	
010	0089_MW195S	HDPE (no PTFE)	20 mL	00350821012811	Grey	No	
010	0089_MW195S	HDPE (no PTFE)	20 mL	00350821012971	Grey	No	
011	0089_MW193	Clear Plastic Bottle - Natural	500 mL	00070821039592	Green	No	
011	0089_MW193	HDPE (no PTFE)	20 mL	00350821012883	Grey	No	
011	0089_MW193	HDPE (no PTFE)	20 mL	00350821013040	Grey	No	
011	0089_MW193	HDPE (no PTFE)	20 mL	00350821012961	Grey	No	
011	0089_MW193	HDPE (no PTFE)	20 mL	00350821012933	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 41979 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

012	0089_MW173	Clear Plastic Bottle - Natural	500 mL	00070821057225	Green	No	
012	0089_MW173	HDPE (no PTFE)	20 mL	003508210159	Grey	No	
012	0089_MW173	HDPE (no PTFE)	20 mL	00350821013009	Grey	No	
012	0089_MW173	HDPE (no PTFE)	20 mL	00350821012802	Grey	No	
012	0089_MW173	HDPE (no PTFE)	20 mL	00350821012938	Grey	No	
013	0089_MW216	Clear Plastic Bottle - Natural	500 mL	00070821057214	Green	No	
013	0089_MW216	HDPE (no PTFE)	20 mL	00350821013075	Grey	No	
013	0089_MW216	HDPE (no PTFE)	20 mL	00350821012781	Grey	No	
013	0089_MW216	HDPE (no PTFE)	20 mL	00350821173131	Grey	No	
013	0089_MW216	HDPE (no PTFE)	20 mL	00350821012864	Grey	No	

Total Bottle Count: ALS: 63, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211340**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 41979	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW_CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 10:30	Issue Date	: 08-Sep-2022
Client Requested Due Date	: 19-Sep-2022	Scheduled Reporting Date	: **19-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 13 / 13

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211340-001	05-Sep-2022 09:28	0089_MW197_220905	✓	✓	✓	✓
EP2211340-002	05-Sep-2022 09:55	0089_MW200_220905	✓	✓	✓	✓
EP2211340-003	05-Sep-2022 11:04	0089_MW199_220905	✓	✓	✓	✓
EP2211340-004	05-Sep-2022 11:15	0089_QC111_220905	✓	✓	✓	✓
EP2211340-005	05-Sep-2022 11:49	0089_MW171_220905	✓	✓	✓	✓
EP2211340-006	05-Sep-2022 12:48	0089_MW158_220905	✓	✓	✓	✓
EP2211340-007	05-Sep-2022 13:03	0089_MW166_220905	✓	✓	✓	✓
EP2211340-008	05-Sep-2022 13:05	0089_MW161_220905	✓	✓	✓	✓
EP2211340-009	05-Sep-2022 13:31	0089_MW195D_220905	✓	✓	✓	✓
EP2211340-010	05-Sep-2022 13:40	0089_MW195S_220905	✓	✓	✓	✓
EP2211340-011	05-Sep-2022 14:00	0089_MW193_220905	✓	✓	✓	✓
EP2211340-012	05-Sep-2022 14:32	0089_MW173_220905	✓	✓	✓	✓
EP2211340-013	05-Sep-2022 14:47	0089_MW216_220905	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211340**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 09-Sep-2022
C-O-C number	: 41979	Issue Date	: 19-Sep-2022 22:43
Sampler	: [redacted] [redacted]		
Site	: Stirling GW_CG		
Quote number	: SY/139/19 B		
No. of samples received	: 13		
No. of samples analysed	: 13		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW197_220905	0089_MW200_220905	0089_MW199_220905	0089_QC111_220905	0089_MW171_220905
				Sampling date / time	05-Sep-2022 09:28	05-Sep-2022 09:55	05-Sep-2022 11:04	05-Sep-2022 11:15	05-Sep-2022 11:49
Compound	CAS Number	LOR	Unit		EP2211340-001	EP2211340-002	EP2211340-003	EP2211340-004	EP2211340-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		701	466	349	357	466
Total Alkalinity as CaCO3	----	1	mg/L		701	466	349	357	466
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		177	214	75	95	596
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		868	2170	495	715	5260
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		63	94	94	96	196
Magnesium	7439-95-4	1	mg/L		200	105	47	61	402
Sodium	7440-23-5	1	mg/L		446	1220	245	355	2620
Potassium	7440-09-7	1	mg/L		32	66	14	19	107
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		42.2	75.0	22.5	29.3	170
ø Total Cations	----	0.01	meq/L		39.8	68.1	19.6	25.7	160
ø Ionic Balance	----	0.01	%		2.87	4.82	6.95	6.44	3.19
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.03
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	0.08
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.05
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW197_220905	0089_MW200_220905	0089_MW199_220905	0089_QC111_220905	0089_MW171_220905
				Sampling date / time	05-Sep-2022 09:28	05-Sep-2022 09:55	05-Sep-2022 11:04	05-Sep-2022 11:15	05-Sep-2022 11:49
Compound	CAS Number	LOR	Unit		EP2211340-001	EP2211340-002	EP2211340-003	EP2211340-004	EP2211340-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW197_220905	0089_MW200_220905	0089_MW199_220905	0089_QC111_220905	0089_MW171_220905
				Sampling date / time	05-Sep-2022 09:28	05-Sep-2022 09:55	05-Sep-2022 11:04	05-Sep-2022 11:15	05-Sep-2022 11:49
Compound	CAS Number	LOR	Unit		EP2211340-001	EP2211340-002	EP2211340-003	EP2211340-004	EP2211340-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.16**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.08**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.16**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**93.1**	**106**	**100**	**100**
13C8-PFOA	----	0.02	%		**95.0**	**93.2**	**97.6**	**91.0**	**93.7**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW158_220905	0089_MW166_220905	0089_MW161_220905	0089_MW195D_220905	0089_MW195S_220905
				Sampling date / time	05-Sep-2022 12:48	05-Sep-2022 13:03	05-Sep-2022 13:05	05-Sep-2022 13:31	05-Sep-2022 13:40
					EP2211340-006	EP2211340-007	EP2211340-008	EP2211340-009	EP2211340-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**443**	**360**	**382**	**167**	**598**
Total Alkalinity as CaCO3	----	1	mg/L		**443**	**360**	**382**	**167**	**598**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**463**	**158**	**181**	**1470**	**282**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**4060**	**856**	**755**	**10800**	**998**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**195**	**110**	**87**	**385**	**177**
Magnesium	7439-95-4	1	mg/L		**334**	**93**	**71**	**834**	**132**
Sodium	7440-23-5	1	mg/L		**2260**	**441**	**422**	**5890**	**518**
Potassium	7440-09-7	1	mg/L		**103**	**39**	**36**	**261**	**43**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**133**	**34.6**	**32.7**	**338**	**46.0**
ø Total Cations	----	0.01	meq/L		**138**	**33.3**	**29.5**	**351**	**43.3**
ø Ionic Balance	----	0.01	%		**1.90**	**1.92**	**5.21**	**1.76**	**2.96**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.02**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.52**	**0.23**	**0.01**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.08**	**0.03**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**6.18**	**3.02**	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.24**	**0.08**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.23**	**0.08**	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW158_220905	0089_MW166_220905	0089_MW161_220905	0089_MW195D_220905	0089_MW195S_220905
				Sampling date / time	05-Sep-2022 12:48	05-Sep-2022 13:03	05-Sep-2022 13:05	05-Sep-2022 13:31	05-Sep-2022 13:40
Compound	CAS Number	LOR	Unit		EP2211340-006	EP2211340-007	EP2211340-008	EP2211340-009	EP2211340-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.12**	**0.03**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.06**	**0.02**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW158_220905	0089_MW166_220905	0089_MW161_220905	0089_MW195D_220905	0089_MW195S_220905
				Sampling date / time	05-Sep-2022 12:48	05-Sep-2022 13:03	05-Sep-2022 13:05	05-Sep-2022 13:31	05-Sep-2022 13:40
					EP2211340-006	EP2211340-007	EP2211340-008	EP2211340-009	EP2211340-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**7.45**	**3.49**	**0.01**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**6.70**	**3.25**	**0.01**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**7.35**	**3.46**	**0.01**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**104**	**99.4**	**98.3**	**97.8**
13C8-PFOA	----	0.02	%		**94.2**	**92.7**	**96.2**	**90.5**	**88.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW193_220905	0089_MW173_220905	0089_MW216_220905	----	----
				Sampling date / time	05-Sep-2022 14:00	05-Sep-2022 14:32	05-Sep-2022 14:47	----	----
Compound	CAS Number	LOR	Unit		EP2211340-011	EP2211340-012	EP2211340-013	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		486	460	287	----	----
Total Alkalinity as CaCO3	----	1	mg/L		486	460	287	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		61	267	110	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		656	1040	533	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		107	104	162	----	----
Magnesium	7439-95-4	1	mg/L		76	93	50	----	----
Sodium	7440-23-5	1	mg/L		320	643	223	----	----
Potassium	7440-09-7	1	mg/L		26	46	8	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		29.5	44.1	23.0	----	----
ø Total Cations	----	0.01	meq/L		26.2	42.0	22.1	----	----
ø Ionic Balance	----	0.01	%		5.94	2.44	2.12	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.55	0.21	0.32	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.97	0.18	0.47	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		9.84	3.74	3.21	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.65	0.59	0.11	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		3.08	5.46	0.98	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		0.2	<0.1	2.3	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.27	0.14	9.12	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		1.60	0.50	6.45	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.12	0.08	0.31	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW193_220905	0089_MW173_220905	0089_MW216_220905	----	----
				Sampling date / time	05-Sep-2022 14:00	05-Sep-2022 14:32	05-Sep-2022 14:47	----	----
Compound	CAS Number	LOR	Unit		EP2211340-011	EP2211340-012	EP2211340-013	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.52**	**0.35**	**0.22**	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	**1.58**	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW193_220905	0089_MW173_220905	0089_MW216_220905	----	----
				Sampling date / time	05-Sep-2022 14:00	05-Sep-2022 14:32	05-Sep-2022 14:47	----	----
Compound	CAS Number	LOR	Unit		EP2211340-011	EP2211340-012	EP2211340-013	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**17.8**	**11.2**	**25.1**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**12.9**	**9.20**	**4.19**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**16.2**	**10.5**	**24.5**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.7**	**94.2**	**99.7**	----	----
13C8-PFOA	----	0.02	%		**91.1**	**92.5**	**93.5**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211340**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 09-Sep-2022
C-O-C number	: 41979	Issue Date	: 19-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW_CG		
Quote number	: SY/139/19 B		
No. of samples received	: 13		
No. of samples analysed	: 13		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4584734)									
EP2211340-002	0089_MW200_220905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	466	462	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	466	462	0.9	0% - 20%
EP2211340-012	0089_MW173_220905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	460	453	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	460	453	1.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4569394)									
EP2211283-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	18	18	0.0	0% - 50%
EP2211425-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4571786)									
EP2211340-006	0089_MW158_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	463	461	0.5	0% - 20%
EP2211593-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2700	1.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4569395)									
EP2211283-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	182	181	0.0	0% - 20%
EP2211425-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	112	112	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4571785)									
EP2211340-006	0089_MW158_220905	ED045G: Chloride	16887-00-6	1	mg/L	4060	4160	2.5	0% - 20%
EP2211593-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18100	18000	0.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4569465)									
EP2211340-001	0089_MW197_220905	ED093F: Calcium	7440-70-2	1	mg/L	63	63	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	200	200	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4569465) - continued									
EP2211340-001	0089_MW197_220905	ED093F: Sodium	7440-23-5	1	mg/L	446	445	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	32	32	0.0	0% - 20%
EP2211340-011	0089_MW193_220905	ED093F: Calcium	7440-70-2	1	mg/L	107	108	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	76	76	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	320	320	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	26	26	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4585517)									
EP2211340-002	0089_MW200_220905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2211340-010	0089_MW195S_220905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4585517)									
EP2211340-002	0089_MW200_220905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2211340-010	0089_MW195S_220905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4585517) - continued									
EP2211340-010	0089_MW195S_220905	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4585517)									
EP2211340-002	0089_MW200_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211340-010	0089_MW195S_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4585517)									
EP2211340-002	0089_MW200_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211340-010	0089_MW195S_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4585517) - continued									
EP2211340-010	0089_MW195S_220905	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4585517)									
EP2211340-002	0089_MW200_220905	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2211340-010	0089_MW195S_220905	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4584734)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	87.8	118
				<1	200 mg/L	95.1	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4569394)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.8	89.9	112
				<1	500 mg/L	102	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4571786)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.6	89.9	112
				<1	500 mg/L	96.2	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4569395)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.3	88.6	113
				<1	1000 mg/L	100	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 4571785)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.3	88.6	113
				<1	1000 mg/L	99.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4569465)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	110	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4585517)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	98.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	98.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4585517)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4585517) - continued								
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	112	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	107	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	126	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4585517)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	102	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	109	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	111	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	101	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	112	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4585517)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	103	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	83.0	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4569394)							
EP2211283-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	104	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4571786)							
EP2211340-006	0089_MW158_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 4569395)							
EP2211283-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	92.8	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4571785)							
EP2211340-006	0089_MW158_220905	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4585517)							
EP2211340-001	0089_MW197_220905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	93.4	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	116	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	100	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	102	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	106	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4585517)							
EP2211340-001	0089_MW197_220905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	109	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	105	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	92.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	125	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4585517)							
EP2211340-001	0089_MW197_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	124	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	109	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	121	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	120	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	114	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	115	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4585517)							
EP2211340-001	0089_MW197_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	91.0	63.0	143

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4585517) - continued							
EP2211340-001	0089_MW197_220905	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	82.8	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211340**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling GW_CG	Issue Date	: 19-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 13
Order number	: pfas-omp/Stirling	No. of samples analysed	: 13

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211340--006	0089_MW158_220905	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2211340--006	0089_MW158_220905	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW197_220905, 0089_MW200_220905, 0089_MW199_220905, 0089_QC111_220905, 0089_MW171_220905, 0089_MW158_220905, 0089_MW166_220905, 0089_MW161_220905, 0089_MW195D_220905, 0089_MW195S_220905, 0089_MW193_220905, 0089_MW173_220905, 0089_MW216_220905	**05-Sep-2022**	**----**	----	----	**16-Sep-2022**	19-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW197_220905, 0089_MW200_220905, 0089_MW199_220905, 0089_QC111_220905, 0089_MW171_220905	**05-Sep-2022**	**----**	----	----	**13-Sep-2022**	03-Oct-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_MW158_220905, 0089_MW166_220905, 0089_MW161_220905, 0089_MW195D_220905, 0089_MW195S_220905, 0089_MW193_220905, 0089_MW173_220905, 0089_MW216_220905	**05-Sep-2022**	**----**	----	----	**16-Sep-2022**	03-Oct-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW197_220905, 0089_MW200_220905, 0089_MW199_220905, 0089_QC111_220905, 0089_MW171_220905	**05-Sep-2022**	**----**	----	----	**13-Sep-2022**	03-Oct-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_MW158_220905, 0089_MW166_220905, 0089_MW161_220905, 0089_MW195D_220905, 0089_MW195S_220905, 0089_MW193_220905, 0089_MW173_220905, 0089_MW216_220905	**05-Sep-2022**	**----**	----	----	**16-Sep-2022**	03-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW197_220905, 0089_MW200_220905, 0089_MW199_220905, 0089_QC111_220905, 0089_MW171_220905, 0089_MW158_220905, 0089_MW166_220905, 0089_MW161_220905, 0089_MW195D_220905, 0089_MW195S_220905, 0089_MW193_220905, 0089_MW173_220905, 0089_MW216_220905	**05-Sep-2022**	**----**	----	----	**09-Sep-2022**	12-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW197_220905, 0089_MW200_220905, 0089_MW199_220905, 0089_QC111_220905, 0089_MW171_220905, 0089_MW158_220905, 0089_MW166_220905, 0089_MW161_220905, 0089_MW195D_220905, 0089_MW195S_220905, 0089_MW193_220905, 0089_MW173_220905, 0089_MW216_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW197_220905, 0089_MW200_220905, 0089_MW199_220905, 0089_QC111_220905, 0089_MW171_220905, 0089_MW158_220905, 0089_MW166_220905, 0089_MW161_220905, 0089_MW195D_220905, 0089_MW195S_220905, 0089_MW193_220905, 0089_MW173_220905, 0089_MW216_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW197_220905, 0089_MW200_220905, 0089_MW199_220905, 0089_QC111_220905, 0089_MW171_220905, 0089_MW158_220905, 0089_MW166_220905, 0089_MW161_220905, 0089_MW195D_220905, 0089_MW195S_220905, 0089_MW193_220905, 0089_MW173_220905, 0089_MW216_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW197_220905, 0089_MW200_220905, 0089_MW199_220905, 0089_QC111_220905, 0089_MW171_220905, 0089_MW158_220905, 0089_MW166_220905, 0089_MW161_220905, 0089_MW195D_220905, 0089_MW195S_220905, 0089_MW193_220905, 0089_MW173_220905, 0089_MW216_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW197_220905, 0089_MW200_220905, 0089_MW199_220905, 0089_QC111_220905, 0089_MW171_220905, 0089_MW158_220905, 0089_MW166_220905, 0089_MW161_220905, 0089_MW195D_220905, 0089_MW195S_220905, 0089_MW193_220905, 0089_MW173_220905, 0089_MW216_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: **41980** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW369		05/09/2022 09:46 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
002	0089_PW345		05/09/2022 10:05 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
003	0089_SW370		05/09/2022 10:13 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
004	0089_PW367		05/09/2022 10:31 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
005	0089_QC110		05/09/2022 10:34 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: **41980** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW369	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW345	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW370	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_PW367	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_QC110	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 41980 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW369	Clear Plastic Bottle - Natural	500 mL	00070821057267	Green	No	
001	0089_PW369	HDPE (no PTFE)	20 mL	00350821012822	Grey	No	
001	0089_PW369	HDPE (no PTFE)	20 mL	00350821012858	Grey	No	
001	0089_PW369	HDPE (no PTFE)	20 mL	00350821013022	Grey	No	
001	0089_PW369	HDPE (no PTFE)	20 mL	00350821013033	Grey	No	
002	0089_PW345	Clear Plastic Bottle - Natural	500 mL	00070821057252	Green	No	
002	0089_PW345	HDPE (no PTFE)	20 mL	00350821012886	Grey	No	
002	0089_PW345	HDPE (no PTFE)	20 mL	00350821012876	Grey	No	
002	0089_PW345	HDPE (no PTFE)	20 mL	00350821013045	Grey	No	
002	0089_PW345	HDPE (no PTFE)	20 mL	00350821012828	Grey	No	
003	0089_SW370	Clear Plastic Bottle - Natural	500 mL	00070821041338	Green	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00350821013041	Grey	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00350821013055	Grey	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00350821012958	Grey	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00350821012923	Grey	No	
004	0089_PW367	Clear Plastic Bottle - Natural	500 mL	00070821057273	Green	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00350821012934	Grey	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00350821012785	Grey	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00350821012970	Grey	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00350821012897	Grey	No	
005	0089_QC110	Clear Plastic Bottle - Natural	500 mL	00070821057257	Green	No	
005	0089_QC110	HDPE (no PTFE)	20 mL	00350821012808	Grey	No	
005	0089_QC110	HDPE (no PTFE)	20 mL	00350821012787	Grey	No	

Total Bottle Count: ALS: 23, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211341**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 41980	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW_CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 10:30	Issue Date	: 07-Sep-2022
Client Requested Due Date	: 19-Sep-2022	Scheduled Reporting Date	: **19-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211341-001	05-Sep-2022 09:46	0089_PW369_220905	✓	✓	✓	✓
EP2211341-002	05-Sep-2022 10:05	0089_PW345_220905	✓	✓	✓	✓
EP2211341-003	05-Sep-2022 10:13	0089_SW370_220905	✓	✓	✓	✓
EP2211341-004	05-Sep-2022 10:31	0089_PW367_220905	✓	✓	✓	✓
EP2211341-005	05-Sep-2022 10:34	0089_QC110_220905	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211341**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 41980	Issue Date	: 19-Sep-2022 18:00
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW_CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW369_220905	0089_PW345_220905	0089_SW370_220905	0089_PW367_220905	0089_QC110_220905
				Sampling date / time	05-Sep-2022 09:46	05-Sep-2022 10:05	05-Sep-2022 10:13	05-Sep-2022 10:31	05-Sep-2022 10:34
Compound	CAS Number	LOR	Unit		EP2211341-001	EP2211341-002	EP2211341-003	EP2211341-004	EP2211341-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	123	123	128	129
Total Alkalinity as CaCO3	----	1	mg/L		124	123	123	128	129
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2440	2500	2520	2490	2370
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18000	18200	18100	18200	17700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		428	415	416	402	407
Magnesium	7439-95-4	1	mg/L		1390	1350	1350	1320	1320
Sodium	7440-23-5	1	mg/L		10800	10500	10500	10300	10300
Potassium	7440-09-7	1	mg/L		618	592	598	582	582
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		561	568	566	568	551
ø Total Cations	----	0.01	meq/L		621	604	604	592	592
ø Ionic Balance	----	0.01	%		5.10	3.05	3.28	2.05	3.56
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.11	<0.01	0.02	0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW369_220905	0089_PW345_220905	0089_SW370_220905	0089_PW367_220905	0089_QC110_220905
				Sampling date / time	05-Sep-2022 09:46	05-Sep-2022 10:05	05-Sep-2022 10:13	05-Sep-2022 10:31	05-Sep-2022 10:34
Compound	CAS Number	LOR	Unit		EP2211341-001	EP2211341-002	EP2211341-003	EP2211341-004	EP2211341-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW369_220905	0089_PW345_220905	0089_SW370_220905	0089_PW367_220905	0089_QC110_220905
				Sampling date / time	05-Sep-2022 09:46	05-Sep-2022 10:05	05-Sep-2022 10:13	05-Sep-2022 10:31	05-Sep-2022 10:34
Compound	CAS Number	LOR	Unit		EP2211341-001	EP2211341-002	EP2211341-003	EP2211341-004	EP2211341-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.11**	<0.01	**0.02**	**0.01**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.11**	<0.01	**0.02**	**0.01**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.11**	<0.01	**0.02**	**0.01**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.7**	**98.5**	**96.6**	**93.3**	**97.5**
13C8-PFOA	----	0.02	%		**93.0**	**96.9**	**93.3**	**91.1**	**95.5**

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211341**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 41980	Issue Date	: 19-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW_CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4584734)									
EP2211340-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	466	462	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	466	462	0.9	0% - 20%
EP2211340-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	460	453	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	460	453	1.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4566526)									
EP2211341-001	0089_PW369_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2440	2460	0.8	0% - 20%
EP2211343-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	5	5	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4566525)									
EP2211341-001	0089_PW369_220905	ED045G: Chloride	16887-00-6	1	mg/L	18000	18300	1.2	0% - 20%
EP2211343-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	179	179	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4566413)									
EP2211341-001	0089_PW369_220905	ED093F: Calcium	7440-70-2	1	mg/L	428	415	3.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1390	1350	3.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	10500	2.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	618	596	3.6	0% - 20%
EP2211343-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	100	102	1.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	33	33	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	106	105	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	4	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4585517)									
EP2211340-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2211340-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4585517)									
EP2211340-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2211340-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4585517)									
EP2211340-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4585517) - continued									
EP2211340-002	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211340-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4585517)									
EP2211340-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211340-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4585517)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4585517) - continued									
EP2211340-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2211340-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4584734)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	108	87.8	118
				<1	200 mg/L	95.1	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566526)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.0	89.9	112
				<1	500 mg/L	95.8	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4566525)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.0	88.6	113
				<1	1000 mg/L	100	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4566413)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100.0	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4585517)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	98.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	98.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4585517)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	112	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	107	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.0	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4585517) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	126	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4585517)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	102	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	109	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	111	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	101	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	112	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4585517)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	103	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	83.0	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566526)							
EP2211341-001	0089_PW369_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4566525)							
EP2211341-001	0089_PW369_220905	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4585517)							
EP2211340-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	93.4	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	116	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	100	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	102	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4585517) - continued							
EP2211340-001	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	106	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4585517)							
EP2211340-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	109	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	105	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	92.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	94.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	125	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4585517)							
EP2211340-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	124	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	109	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	121	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	120	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	114	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	115	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4585517)							
EP2211340-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	91.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	82.8	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211341**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SW/PW_CG	Issue Date	: 19-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211341--001	0089_PW369_220905	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2211341--001	0089_PW369_220905	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW369_220905, 0089_PW345_220905, 0089_SW370_220905, 0089_PW367_220905, 0089_QC110_220905	**05-Sep-2022**	**----**	----	----	**16-Sep-2022**	19-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW369_220905, 0089_PW345_220905, 0089_SW370_220905, 0089_PW367_220905, 0089_QC110_220905	**05-Sep-2022**	**----**	----	----	**19-Sep-2022**	03-Oct-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW369_220905, 0089_PW345_220905, 0089_SW370_220905, 0089_PW367_220905, 0089_QC110_220905	**05-Sep-2022**	**----**	----	----	**19-Sep-2022**	03-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW369_220905, 0089_PW345_220905, 0089_SW370_220905, 0089_PW367_220905, 0089_QC110_220905	**05-Sep-2022**	**----**	----	----	**12-Sep-2022**	12-Sep-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW369_220905, 0089_PW345_220905, 0089_SW370_220905, 0089_PW367_220905, 0089_QC110_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW369_220905, 0089_PW345_220905, 0089_SW370_220905, 0089_PW367_220905, 0089_QC110_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW369_220905, 0089_PW345_220905, 0089_SW370_220905, 0089_PW367_220905, 0089_QC110_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW369_220905, 0089_PW345_220905, 0089_SW370_220905, 0089_PW367_220905, 0089_QC110_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW369_220905, 0089_PW345_220905, 0089_SW370_220905, 0089_PW367_220905, 0089_QC110_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 41981 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD_CG

ORDER NO: pfas-omp/Stirling

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD369		05/09/2022 09:43 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD345		05/09/2022 10:02 AM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD367		05/09/2022 10:47 AM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_QC109		05/09/2022 10:48 AM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: **41981** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD_CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD369	HDPE Soil Jar	200 mL	00620322012236	Grey	No	
002	0089_SD345	HDPE Soil Jar	200 mL	00620322012191	Grey	No	
003	0089_SD367	HDPE Soil Jar	200 mL	00620322012203	Grey	No	
004	0089_QC109	HDPE Soil Jar	200 mL	00620322012186	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211342**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 41981	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD_CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 10:30	Issue Date	: 07-Sep-2022
Client Requested Due Date	: 16-Sep-2022	Scheduled Reporting Date	: **16-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2211342-001	05-Sep-2022 09:43	0089_SD369_220905	✓	✓
EP2211342-002	05-Sep-2022 10:02	0089_SD345_220905	✓	✓
EP2211342-003	05-Sep-2022 10:47	0089_SD367_220905	✓	✓
EP2211342-004	05-Sep-2022 10:48	0089_QC109_220905	✓	✓
EP2211342-005	05-Sep-2022 00:00	0089_QC112_220905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email [redacted]

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211342**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Sep-2022
C-O-C number	: 41981	Issue Date	: 16-Sep-2022 09:50
Sampler	: [redacted] [redacted]		
Site	: Stirling SD_CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD369_220905	0089_SD345_220905	0089_SD367_220905	0089_QC109_220905	0089_QC112_220905
			Sampling date / time	05-Sep-2022 09:43	05-Sep-2022 10:02	05-Sep-2022 10:47	05-Sep-2022 10:48	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit	EP2211342-001	EP2211342-002	EP2211342-003	EP2211342-004	EP2211342-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**29.9**	**33.1**	**29.8**	**29.9**	**27.8**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0020**	**0.0016**	**0.0011**	**0.0011**	**0.0004**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD369_220905	0089_SD345_220905	0089_SD367_220905	0089_QC109_220905	0089_QC112_220905
				Sampling date / time	05-Sep-2022 09:43	05-Sep-2022 10:02	05-Sep-2022 10:47	05-Sep-2022 10:48	05-Sep-2022 00:00
Compound	CAS Number	LOR	Unit		EP2211342-001	EP2211342-002	EP2211342-003	EP2211342-004	EP2211342-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0020**	**0.0016**	**0.0011**	**0.0011**	**0.0004**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0020**	**0.0016**	**0.0011**	**0.0011**	**0.0004**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0020**	**0.0016**	**0.0011**	**0.0011**	**0.0004**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**110**	**96.0**	**107**	**101**	**106**
13C8-PFOA	----	0.0002	%		**112**	**100**	**105**	**96.5**	**103**

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211342**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Sep-2022
C-O-C number	: 41981	Issue Date	: 16-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD_CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4580164)									
EP2211342-003	0089_SD367_220905	EA055: Moisture Content	----	0.1	%	29.8	28.6	4.1	0% - 20%
EP2211346-009	Anonymous	EA055: Moisture Content	----	0.1	%	32.7	34.5	5.6	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4578519)									
EP2211267-069	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2211342-005	0089_QC112_220905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0004	0.0003	29.1	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4578519)									
EP2211267-069	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4578519) - continued									
EP2211267-069	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2211342-005	0089_QC112_220905	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4578519)									
EP2211267-069	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211342-005	0089_QC112_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4578519)									
EP2211267-069	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211342-005	0089_QC112_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4578519)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4578519)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	118	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578519)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578519)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	110	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	117	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	120	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578519) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	116	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4578519)							
EP2211267-069	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	113	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	117	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	106	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	122	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	126	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	115	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4578519)							
EP2211267-069	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	117	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	122	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	114	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	119	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	123	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	122	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	118	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	121	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	122	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	116	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	120	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578519)							
EP2211267-069	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	110	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	108	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	109	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	127	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	107	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	117	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578519) - continued							
EP2211267-069	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	114	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578519)							
EP2211267-069	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	128	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	119	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	118	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	117	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211342**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SD_CG	Issue Date	: 16-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD369_220905, 0089_SD345_220905, 0089_SD367_220905, 0089_QC109_220905, 0089_QC112_220905	**05-Sep-2022**	**----**	----	----	**14-Sep-2022**	19-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD369_220905, 0089_SD345_220905, 0089_SD367_220905, 0089_QC109_220905, 0089_QC112_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD369_220905, 0089_SD345_220905, 0089_SD367_220905, 0089_QC109_220905, 0089_QC112_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD369_220905, 0089_SD345_220905, 0089_SD367_220905, 0089_QC109_220905, 0089_QC112_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD369_220905, 0089_SD345_220905, 0089_SD367_220905, 0089_QC109_220905, 0089_QC112_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD369_220905, 0089_SD345_220905, 0089_SD367_220905, 0089_QC109_220905, 0089_QC112_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 41985 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW139		05/09/2022 09:02 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
002	0089_MW141		05/09/2022 09:27 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_QC101		05/09/2022 09:28 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW142		05/09/2022 11:47 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW149		05/09/2022 11:57 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW123		05/09/2022 01:05 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_QC114		05/09/2022 01:06 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_MW121		05/09/2022 01:24 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
009	0089_MW120		05/09/2022 01:39 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

COC#: **41985** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_QC116		05/09/2022 01:39 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
011	0089_MW112		05/09/2022 01:51 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
012	0089_MW109		05/09/2022 02:06 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
013	0089_QC117		05/09/2022 02:07 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
014	0089_MW500		05/09/2022 02:21 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
015	0089_MW128		05/09/2022 02:34 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
016	0089_QC301		05/09/2022 02:50 PM	Water	ALS: 2 Non ALS: 0	No		X		
017	0089_QC302		05/09/2022 02:50 PM	Water	ALS: 2 Non ALS: 0	No		X		
018	0089_QC303		05/09/2022 02:50 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: **41985** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_QC401		05/09/2022 02:51 PM	Water	ALS: 2 Non ALS: 0	No		X		
020	0089_QC402		05/09/2022 02:51 PM	Water	ALS: 2 Non ALS: 0	No		X		
021	0089_QC403		05/09/2022 02:52 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 41985 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW139	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW141	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_QC101	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW142	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW149	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW123	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_QC114	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW121	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW120	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 41985 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_QC116	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW112	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW109	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_QC117	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_MW500	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_MW128	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 41985 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW139	Clear Plastic Bottle - Natural	500 mL	00070821039440	Green	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350821012904	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350821012520	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350821012800	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00350821012549	Grey	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350821013000	Grey	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00350821012559	Grey	No	
002	0089_MW141	Clear Plastic Bottle - Natural	500 mL	00070821057234	Green	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00350821012481	Grey	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00350821012735	Grey	No	
003	0089_QC101	Clear Plastic Bottle - Natural	500 mL	00070821039490	Green	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350821012981	Grey	No	
004	0089_MW142	Clear Plastic Bottle - Natural	500 mL	00070821039538	Green	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00350821012893	Grey	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00350821013066	Grey	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00350821013056	Grey	No	
005	0089_MW149	Clear Plastic Bottle - Natural	500 mL	00070821041336	Green	No	
006	0089_MW123	HDPE (no PTFE)	20 mL	00350821013051	Grey	No	
006	0089_MW123	HDPE (no PTFE)	20 mL	00350821012504	Grey	No	
006	0089_MW123	Clear Plastic Bottle - Natural	500 mL	00070821057233	Green	No	
007	0089_QC114	Clear Plastic Bottle - Natural	500 mL	00070821039463	Green	No	
007	0089_QC114	HDPE (no PTFE)	20 mL	00350821012662	Grey	No	
007	0089_QC114	HDPE (no PTFE)	20 mL	00350821012700	Grey	No	
008	0089_MW121	HDPE (no PTFE)	20 mL	00350821012997	Grey	No	
008	0089_MW121	HDPE (no PTFE)	20 mL	00350821012579	Grey	No	
008	0089_MW121	HDPE (no PTFE)	20 mL	00350621067383	Grey	No	

CHAIN OF CUSTODY

ALS COC#: **41985** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_MW121	HDPE (no PTFE)	20 mL	00350621067023	Grey	No	
008	0089_MW121	Clear Plastic Bottle - Natural	500 mL	00070821057221	Green	No	
009	0089_MW120	Clear Plastic Bottle - Natural	500 mL	00070821057264	Green	No	
009	0089_MW120	HDPE (no PTFE)	20 mL	00350821012492	Grey	No	
009	0089_MW120	HDPE (no PTFE)	20 mL	00350821012685	Grey	No	
010	0089_QC116	HDPE (no PTFE)	20 mL	00350821012952	Grey	No	
010	0089_QC116	HDPE (no PTFE)	20 mL	00350821012584	Grey	No	
010	0089_QC116	Clear Plastic Bottle - Natural	500 mL	00070821039496	Green	No	
011	0089_MW112	Clear Plastic Bottle - Natural	500 mL	00070821039565	Green	No	
011	0089_MW112	HDPE (no PTFE)	20 mL	00350821012583	Grey	No	
011	0089_MW112	HDPE (no PTFE)	20 mL	00350821012998	Grey	No	
012	0089_MW109	HDPE (no PTFE)	20 mL	00350821012497	Grey	No	
012	0089_MW109	HDPE (no PTFE)	20 mL	00350821012990	Grey	No	
012	0089_MW109	Clear Plastic Bottle - Natural	500 mL	00070821057263	Green	No	
013	0089_QC117	HDPE (no PTFE)	20 mL	00350821012977	Grey	No	
013	0089_QC117	HDPE (no PTFE)	20 mL	00350821012615	Grey	No	
013	0089_QC117	Clear Plastic Bottle - Natural	500 mL	00070821039540	Green	No	
014	0089_MW500	HDPE (no PTFE)	20 mL	00350821012710	Grey	No	
014	0089_MW500	HDPE (no PTFE)	20 mL	00350821012843	Grey	No	
014	0089_MW500	HDPE (no PTFE)	20 mL	00350821012501	Grey	No	
014	0089_MW500	HDPE (no PTFE)	20 mL	00350821012823	Grey	No	
014	0089_MW500	Clear Plastic Bottle - Natural	500 mL	00070821041332	Green	No	
015	0089_MW128	HDPE (no PTFE)	20 mL	00350821012555	Grey	No	
015	0089_MW128	HDPE (no PTFE)	20 mL	00350821012525	Grey	No	
015	0089_MW128	Clear Plastic Bottle - Natural	500 mL	00070821039599	Green	No	
016	0089_QC301	HDPE (no PTFE)	20 mL	00350821013002	Grey	No	
016	0089_QC301	HDPE (no PTFE)	20 mL	00350821012792	Grey	No	

CHAIN OF CUSTODY

COC#: **41985** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

017	0089_QC302	HDPE (no PTFE)	20 mL	00350821012880	Grey	No	
017	0089_QC302	HDPE (no PTFE)	20 mL	00350821012861	Grey	No	
018	0089_QC303	HDPE (no PTFE)	20 mL	00350821012875	Grey	No	
018	0089_QC303	HDPE (no PTFE)	20 mL	00350821012964	Grey	No	
019	0089_QC401	HDPE (no PTFE)	20 mL	00350821012935	Grey	No	
019	0089_QC401	HDPE (no PTFE)	20 mL	00350821013067	Grey	No	
020	0089_QC402	HDPE (no PTFE)	20 mL	00350821012956	Grey	No	
020	0089_QC402	HDPE (no PTFE)	20 mL	00350821012992	Grey	No	
021	0089_QC403	HDPE (no PTFE)	20 mL	00350821013005	Grey	No	
021	0089_QC403	HDPE (no PTFE)	20 mL	00350821013059	Grey	No	

Total Bottle Count: ALS: 63, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211343**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 41985	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 10:30	Issue Date	: 07-Sep-2022
Client Requested Due Date	: 19-Sep-2022	Scheduled Reporting Date	: **19-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 21 / 21

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211343-001	05-Sep-2022 09:02	0089_MW139_220905	✓	✓	✓	✓
EP2211343-002	05-Sep-2022 09:27	0089_MW141_220905	✓	✓	✓	✓
EP2211343-003	05-Sep-2022 09:28	0089_QC101_220905	✓	✓	✓	✓
EP2211343-004	05-Sep-2022 11:47	0089_MW142_220905	✓	✓	✓	✓
EP2211343-005	05-Sep-2022 11:57	0089_MW149_220905	✓	✓	✓	✓
EP2211343-006	05-Sep-2022 13:05	0089_MW123_220905	✓	✓	✓	✓
EP2211343-007	05-Sep-2022 13:06	0089_QC114_220905	✓	✓	✓	✓
EP2211343-008	05-Sep-2022 13:24	0089_MW121_220905	✓	✓	✓	✓
EP2211343-009	05-Sep-2022 13:39	0089_MW120_220905	✓	✓	✓	✓
EP2211343-010	05-Sep-2022 13:39	0089_QC116_220905	✓	✓	✓	✓
EP2211343-011	05-Sep-2022 13:51	0089_MW112_220905	✓	✓	✓	✓
EP2211343-012	05-Sep-2022 14:06	0089_MW109_220905	✓	✓	✓	✓
EP2211343-013	05-Sep-2022 14:07	0089_QC117_220905	✓	✓	✓	✓
EP2211343-014	05-Sep-2022 14:21	0089_MW500_220905	✓	✓	✓	✓
EP2211343-015	05-Sep-2022 14:34	0089_MW128_220905	✓	✓	✓	✓
EP2211343-016	05-Sep-2022 14:50	0089_QC301_220905		✓		
EP2211343-017	05-Sep-2022 14:50	0089_QC302_220905		✓		
EP2211343-018	05-Sep-2022 14:50	0089_QC303_220905		✓		
EP2211343-019	05-Sep-2022 14:51	0089_QC401_220905		✓		
EP2211343-020	05-Sep-2022 14:51	0089_QC402_220905		✓		
EP2211343-021	05-Sep-2022 14:52	0089_QC403_220905		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]stantec.com

DERP LAB REPORTS

- EDI Format - ESDAT (ESDAT)	Email	[redacted]

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]stantec.com
- Chain of Custody (CoC) (COC)	Email	[redacted]stantec.com
- EDI Format - ESDAT (ESDAT)	Email	[redacted]stantec.com
- EDI Format - XTab (XTAB)	Email	[redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211343**	Page	: 1 of 16
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 41985	Issue Date	: 20-Sep-2022 17:25
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 21		
No. of samples analysed	: 21		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_220905	0089_MW141_220905	0089_QC101_220905	0089_MW142_220905	0089_MW149_220905
				Sampling date / time	05-Sep-2022 09:02	05-Sep-2022 09:27	05-Sep-2022 09:28	05-Sep-2022 11:47	05-Sep-2022 11:57
Compound	CAS Number	LOR	Unit		EP2211343-001	EP2211343-002	EP2211343-003	EP2211343-004	EP2211343-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		173	475	600	347	139
Total Alkalinity as CaCO3	----	1	mg/L		173	475	600	347	139
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		66	923	933	1300	2350
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		595	8390	9060	10400	16500
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		82	412	396	358	397
Magnesium	7439-95-4	1	mg/L		50	607	679	803	1230
Sodium	7440-23-5	1	mg/L		297	4190	4710	5570	8650
Potassium	7440-09-7	1	mg/L		15	209	241	284	453
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		21.6	265	287	327	517
ø Total Cations	----	0.01	meq/L		21.5	258	287	333	509
ø Ionic Balance	----	0.01	%		0.24	1.39	0.05	0.93	0.80
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.58	0.52	0.11	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	1.94	1.75	0.25	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	29.2	27.3	6.64	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	2.35	2.08	0.13	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	102	102	2.77	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	0.3	0.3	0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	1.30	1.29	0.29	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	13.4	13.0	2.55	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	0.54	0.50	0.07	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_220905	0089_MW141_220905	0089_QC101_220905	0089_MW142_220905	0089_MW149_220905
				Sampling date / time	05-Sep-2022 09:02	05-Sep-2022 09:27	05-Sep-2022 09:28	05-Sep-2022 11:47	05-Sep-2022 11:57
Compound	CAS Number	LOR	Unit		EP2211343-001	EP2211343-002	EP2211343-003	EP2211343-004	EP2211343-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**2.86**	**2.68**	**0.41**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.05**	**0.04**	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_220905	0089_MW141_220905	0089_QC101_220905	0089_MW142_220905	0089_MW149_220905
				Sampling date / time	05-Sep-2022 09:02	05-Sep-2022 09:27	05-Sep-2022 09:28	05-Sep-2022 11:47	05-Sep-2022 11:57
Compound	CAS Number	LOR	Unit		EP2211343-001	EP2211343-002	EP2211343-003	EP2211343-004	EP2211343-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**154**	**151**	**13.3**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**131**	**129**	**9.41**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**150**	**148**	**12.9**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**82.0**	**76.9**	**93.6**	**106**
13C8-PFOA	----	0.02	%		**105**	**108**	**107**	**108**	**106**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW123_220905	0089_QC114_220905	0089_MW121_220905	0089_MW120_220905	0089_QC116_220905
				Sampling date / time	05-Sep-2022 13:05	05-Sep-2022 13:06	05-Sep-2022 13:24	05-Sep-2022 13:39	05-Sep-2022 13:39
					EP2211343-006	EP2211343-007	EP2211343-008	EP2211343-009	EP2211343-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**410**	**383**	**252**	**252**	**260**
Total Alkalinity as CaCO3	----	1	mg/L		**410**	**383**	**252**	**252**	**260**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**5**	**7**	**9**	**18**	**21**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**179**	**159**	**25**	**51**	**52**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**100**	**101**	**66**	**72**	**73**
Magnesium	7439-95-4	1	mg/L		**33**	**30**	**10**	**18**	**18**
Sodium	7440-23-5	1	mg/L		**106**	**94**	**18**	**34**	**34**
Potassium	7440-09-7	1	mg/L		**5**	**4**	**3**	**3**	**3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**13.3**	**12.3**	**5.93**	**6.85**	**7.10**
ø Total Cations	----	0.01	meq/L		**12.4**	**11.7**	**4.98**	**6.63**	**6.68**
ø Ionic Balance	----	0.01	%		**3.49**	**2.43**	**8.72**	**1.62**	**3.04**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.10**	**0.13**	<0.02	**0.03**	**0.02**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.10**	**0.13**	<0.02	**0.07**	**0.08**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.24**	**0.41**	**0.10**	**22.2**	**21.5**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	**3.67**	**3.54**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.04**	**0.04**	**0.09**	**0.36**	**0.33**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.04**	**0.06**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.19**	**0.26**	**0.02**	**0.11**	**0.12**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_220905	0089_QC114_220905	0089_MW121_220905	0089_MW120_220905	0089_QC116_220905
				Sampling date / time	05-Sep-2022 13:05	05-Sep-2022 13:06	05-Sep-2022 13:24	05-Sep-2022 13:39	05-Sep-2022 13:39
Compound	CAS Number	LOR	Unit		EP2211343-006	EP2211343-007	EP2211343-008	EP2211343-009	EP2211343-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.02**	**2.00**	**2.00**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_220905	0089_QC114_220905	0089_MW121_220905	0089_MW120_220905	0089_QC116_220905
				Sampling date / time	05-Sep-2022 13:05	05-Sep-2022 13:06	05-Sep-2022 13:24	05-Sep-2022 13:39	05-Sep-2022 13:39
Compound	CAS Number	LOR	Unit		EP2211343-006	EP2211343-007	EP2211343-008	EP2211343-009	EP2211343-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.71**	**1.03**	**0.23**	**28.4**	**27.6**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.28**	**0.45**	**0.19**	**22.6**	**21.8**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.61**	**0.90**	**0.23**	**24.7**	**24.0**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**107**	**99.3**	**101**	**102**
13C8-PFOA	----	0.02	%		**110**	**105**	**105**	**105**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_220905	0089_MW109_220905	0089_QC117_220905	0089_MW500_220905	0089_MW128_220905
				Sampling date / time	05-Sep-2022 13:51	05-Sep-2022 14:06	05-Sep-2022 14:07	05-Sep-2022 14:21	05-Sep-2022 14:34
Compound	CAS Number	LOR	Unit		EP2211343-011	EP2211343-012	EP2211343-013	EP2211343-014	EP2211343-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		219	303	303	303	326
Total Alkalinity as CaCO3	----	1	mg/L		219	303	303	303	326
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		8	21	20	19	26
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		26	94	96	34	45
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		70	92	93	98	68
Magnesium	7439-95-4	1	mg/L		9	20	20	13	26
Sodium	7440-23-5	1	mg/L		15	63	64	23	52
Potassium	7440-09-7	1	mg/L		<1	1	1	<1	5
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		5.28	9.14	9.18	7.41	8.32
ø Total Cations	----	0.01	meq/L		4.89	9.00	9.10	6.96	7.92
ø Ionic Balance	----	0.01	%		3.83	0.77	0.45	3.12	2.47
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.07	0.06	0.06	0.32	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.21	0.14	0.14	0.70	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		8.15	0.53	0.53	13.3	0.41
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.98	<0.02	<0.02	2.27	0.09
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		59.5	0.08	0.09	57.8	7.38
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	0.2	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.18	<0.02	<0.02	0.30	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.73	0.09	0.08	1.92	0.05
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.28	<0.02	<0.02	0.31	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_220905	0089_MW109_220905	0089_QC117_220905	0089_MW500_220905	0089_MW128_220905
				Sampling date / time	05-Sep-2022 13:51	05-Sep-2022 14:06	05-Sep-2022 14:07	05-Sep-2022 14:21	05-Sep-2022 14:34
Compound	CAS Number	LOR	Unit		EP2211343-011	EP2211343-012	EP2211343-013	EP2211343-014	EP2211343-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.40**	**0.01**	**0.02**	**1.22**	**0.09**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.69**	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_220905	0089_MW109_220905	0089_QC117_220905	0089_MW500_220905	0089_MW128_220905
				Sampling date / time	05-Sep-2022 13:51	05-Sep-2022 14:06	05-Sep-2022 14:07	05-Sep-2022 14:21	05-Sep-2022 14:34
Compound	CAS Number	LOR	Unit		EP2211343-011	EP2211343-012	EP2211343-013	EP2211343-014	EP2211343-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**72.2**	**0.91**	**0.92**	**78.3**	**8.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**67.6**	**0.61**	**0.62**	**71.1**	**7.79**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**70.3**	**0.77**	**0.78**	**75.4**	**7.93**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.3**	**108**	**92.4**	**81.1**	**99.1**
13C8-PFOA	----	0.02	%		**108**	**104**	**105**	**117**	**110**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC301_220905	0089_QC302_220905	0089_QC303_220905	0089_QC401_220905	0089_QC402_220905
				Sampling date / time	05-Sep-2022 14:50	05-Sep-2022 14:50	05-Sep-2022 14:50	05-Sep-2022 14:51	05-Sep-2022 14:51
					EP2211343-016	EP2211343-017	EP2211343-018	EP2211343-019	EP2211343-020
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220905	0089_QC302_220905	0089_QC303_220905	0089_QC401_220905	0089_QC402_220905
				Sampling date / time	05-Sep-2022 14:50	05-Sep-2022 14:50	05-Sep-2022 14:50	05-Sep-2022 14:51	05-Sep-2022 14:51
Compound	CAS Number	LOR	Unit		EP2211343-016	EP2211343-017	EP2211343-018	EP2211343-019	EP2211343-020
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.1**	**96.7**	**103**	**106**	**97.4**
13C8-PFOA	----	0.02	%		**110**	**104**	**105**	**108**	**103**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	**0089_QC403_220905**	----	----	----	----
				Sampling date / time	05-Sep-2022 14:52	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2211343-021**	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_220905	----	----	----	----
				Sampling date / time	05-Sep-2022 14:52	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211343-021	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.9**	----	----	----	----
13C8-PFOA	----	0.02	%		**99.1**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211343**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 41985	Issue Date	: 20-Sep-2022
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 21		
No. of samples analysed	: 21		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4585147)									
EP2211343-002	0089_MW141_220905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	475	472	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	475	472	0.7	0% - 20%
EP2211343-012	0089_MW109_220905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	303	299	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	303	299	1.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4566526)									
EP2211341-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2440	2460	0.8	0% - 20%
EP2211343-006	0089_MW123_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	5	5	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4566525)									
EP2211341-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18000	18300	1.2	0% - 20%
EP2211343-006	0089_MW123_220905	ED045G: Chloride	16887-00-6	1	mg/L	179	179	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4566413)									
EP2211341-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	428	415	3.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1390	1350	3.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	10500	2.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	618	596	3.6	0% - 20%
EP2211343-006	0089_MW123_220905	ED093F: Calcium	7440-70-2	1	mg/L	100	102	1.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	33	33	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	106	105	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	4	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4585521)									
EP2211343-001	0089_MW139_220905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2211343-014	0089_MW500_220905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	13.3	13.7	2.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	57.8	59.8	3.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.32	0.34	6.1	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.70	0.78	10.1	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	2.27	2.20	3.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4586333)									
EP2211347-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4585521)									
EP2211343-001	0089_MW139_220905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2211343-014	0089_MW500_220905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.22	1.20	1.5	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.30	0.30	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.92	2.09	8.5	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.31	0.30	0.0	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4585521) - continued									
EP2211343-014	0089_MW500_220905	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	0.2	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4586333)									
EP2211347-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4585521)									
EP2211343-001	0089_MW139_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211343-014	0089_MW500_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4586333)									
EP2211347-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4585521)									
EP2211343-001	0089_MW139_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211343-014	0089_MW500_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4586333)									
EP2211347-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4585521)									
EP2211343-001	0089_MW139_220905	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4585521) - continued									
EP2211343-014	0089_MW500_220905	EP231X: Sum of PFAS	----	0.01	µg/L	78.3	80.9	3.3	0% - 20%
EP231P: PFAS Sums (QC Lot: 4586333)									
EP2211347-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4585147)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	98.1	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566526)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.0	89.9	112
				<1	500 mg/L	95.8	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4566525)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.0	88.6	113
				<1	1000 mg/L	100	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4566413)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100.0	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	107	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4585521)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	98.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	113	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	125	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4586333)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	125	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	75.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	116	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	116	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4585521)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	106	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4585521) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	124	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	98.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	120	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4586333)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	127	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	99.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	117	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	130	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	123	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	125	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4585521)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	129	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	91.6	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	124	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	122	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	129	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	115	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586333)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	126	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	120	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	113	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	109	66.0	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586333) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	124	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	132	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	125	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4585521)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	125	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	128	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	98.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586333)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	114	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	91.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	135	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	134	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566526)							
EP2211341-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4566525)							
EP2211341-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4585521)							
EP2211343-008	0089_MW121_220905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	110	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	107	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	107	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	120	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	106	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	92.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4586333)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4586333) - continued							
EP2211347-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	121	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	127	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	128	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	127	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	126	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	133	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4585521)							
EP2211343-008	0089_MW121_220905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	110	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	114	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	126	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	115	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	120	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	105	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	112	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	121	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	122	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	111	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	130	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4586333)							
EP2211347-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	102	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	123	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	124	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	116	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	121	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	124	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	123	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	122	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4585521)							
EP2211343-008	0089_MW121_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	122	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	141	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	136	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	122	66.0	145

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4585521) - continued							
EP2211343-008	0089_MW121_220905	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	124	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	121	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	126	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586333)							
EP2211347-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	117	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	135	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	119	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	116	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	124	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	117	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	111	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4585521)							
EP2211343-008	0089_MW121_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	130	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	135	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	109	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	86.6	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586333)							
EP2211347-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	126	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	80.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	116	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	96.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211343**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling GW - MB	Issue Date	: 20-Sep-2022
Sampler	: [redacted]	No. of samples received	: 21
Order number	: pfas-omp/Stirling	No. of samples analysed	: 21

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211341--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2211341--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	3	35	8.57	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW139_220905, 0089_QC101_220905, 0089_MW149_220905, 0089_QC114_220905, 0089_MW120_220905, 0089_MW112_220905, 0089_QC117_220905, 0089_MW128_220905, 0089_MW141_220905, 0089_MW142_220905, 0089_MW123_220905, 0089_MW121_220905, 0089_QC116_220905, 0089_MW109_220905, 0089_MW500_220905,	**05-Sep-2022**	**----**	----	----	**16-Sep-2022**	19-Sep-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW139_220905, 0089_MW141_220905, 0089_QC101_220905, 0089_MW142_220905, 0089_MW149_220905, 0089_MW123_220905, 0089_QC114_220905, 0089_MW121_220905, 0089_MW120_220905, 0089_QC116_220905, 0089_MW112_220905, 0089_MW109_220905, 0089_QC117_220905, 0089_MW500_220905, 0089_MW128_220905	**05-Sep-2022**	**----**	----	----	**19-Sep-2022**	03-Oct-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW139_220905, 0089_MW141_220905, 0089_QC101_220905, 0089_MW142_220905, 0089_MW149_220905, 0089_MW123_220905, 0089_QC114_220905, 0089_MW121_220905, 0089_MW120_220905, 0089_QC116_220905, 0089_MW112_220905, 0089_MW109_220905, 0089_QC117_220905, 0089_MW500_220905, 0089_MW128_220905	**05-Sep-2022**	**----**	----	----	**19-Sep-2022**	03-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW139_220905, 0089_MW141_220905, 0089_QC101_220905, 0089_MW142_220905, 0089_MW149_220905, 0089_MW123_220905, 0089_QC114_220905, 0089_MW121_220905, 0089_MW120_220905, 0089_QC116_220905, 0089_MW112_220905, 0089_MW109_220905, 0089_QC117_220905, 0089_MW500_220905, 0089_MW128_220905	**05-Sep-2022**	**----**	----	----	**12-Sep-2022**	12-Sep-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_220905, 0089_MW141_220905, 0089_QC101_220905, 0089_MW142_220905, 0089_MW149_220905, 0089_MW123_220905, 0089_QC114_220905, 0089_MW121_220905, 0089_MW120_220905, 0089_QC116_220905, 0089_MW112_220905, 0089_MW109_220905, 0089_QC117_220905, 0089_MW500_220905, 0089_MW128_220905, 0089_QC301_220905, 0089_QC302_220905, 0089_QC303_220905, 0089_QC401_220905, 0089_QC402_220905, 0089_QC403_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_220905, 0089_MW141_220905, 0089_QC101_220905, 0089_MW142_220905, 0089_MW149_220905, 0089_MW123_220905, 0089_QC114_220905, 0089_MW121_220905, 0089_MW120_220905, 0089_QC116_220905, 0089_MW112_220905, 0089_MW109_220905, 0089_QC117_220905, 0089_MW500_220905, 0089_MW128_220905, 0089_QC301_220905, 0089_QC302_220905, 0089_QC303_220905, 0089_QC401_220905, 0089_QC402_220905, 0089_QC403_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW139_220905, 0089_MW141_220905, 0089_QC101_220905, 0089_MW142_220905, 0089_MW149_220905, 0089_MW123_220905, 0089_QC114_220905, 0089_MW121_220905, 0089_MW120_220905, 0089_QC116_220905, 0089_MW112_220905, 0089_MW109_220905, 0089_QC117_220905, 0089_MW500_220905, 0089_MW128_220905, 0089_QC301_220905, 0089_QC302_220905, 0089_QC303_220905, 0089_QC401_220905, 0089_QC402_220905, 0089_QC403_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_220905, 0089_MW141_220905, 0089_QC101_220905, 0089_MW142_220905, 0089_MW149_220905, 0089_MW123_220905, 0089_QC114_220905, 0089_MW121_220905, 0089_MW120_220905, 0089_QC116_220905, 0089_MW112_220905, 0089_MW109_220905, 0089_QC117_220905, 0089_MW500_220905, 0089_MW128_220905, 0089_QC301_220905, 0089_QC302_220905, 0089_QC303_220905, 0089_QC401_220905, 0089_QC402_220905, 0089_QC403_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW139_220905, 0089_MW141_220905, 0089_QC101_220905, 0089_MW142_220905, 0089_MW149_220905, 0089_MW123_220905, 0089_QC114_220905, 0089_MW121_220905, 0089_MW120_220905, 0089_QC116_220905, 0089_MW112_220905, 0089_MW109_220905, 0089_QC117_220905, 0089_MW500_220905, 0089_MW128_220905, 0089_QC301_220905, 0089_QC302_220905, 0089_QC303_220905, 0089_QC401_220905, 0089_QC402_220905, 0089_QC403_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	35	**8.57**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **41986** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]
PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW335		05/09/2022 09:14 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_SW130		05/09/2022 09:14 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
003	0089_PW364		05/09/2022 09:24 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
004	0089_SW132		05/09/2022 09:54 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_QC104		05/09/2022 09:56 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW340		05/09/2022 10:06 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW362		05/09/2022 10:24 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_QC108		05/09/2022 10:34 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_PW341		05/09/2022 10:53 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 41986 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW134		05/09/2022 11:04 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
011	0089_PW363		05/09/2022 11:14 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
012	0089_SW371		05/09/2022 12:51 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
013	0089_PW368		05/09/2022 12:54 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
014	0089_SW305		05/09/2022 12:59 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
015	0089_QC115		05/09/2022 01:00 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
016	0089_PW304		05/09/2022 01:02 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
017	0089_QC118		05/09/2022 02:04 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: 41986 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_PW335	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW130	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW364	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW132	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_QC104	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW340	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW362	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_QC108	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW341	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 41986 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_SW134	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_PW363	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_SW371	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_PW368	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_SW305	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_QC115	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
016	0089_PW304	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
017	0089_QC118	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 41986 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_PW335	Clear Plastic Bottle - Natural	500 mL	00070821039436	Green	No	
001	0089_PW335	HDPE (no PTFE)	20 mL	00350821012570	Grey	No	
001	0089_PW335	HDPE (no PTFE)	20 mL	00350821012707	Grey	No	
002	0089_SW130	Clear Plastic Bottle - Natural	500 mL	00070821057255	Green	No	
002	0089_SW130	HDPE (no PTFE)	20 mL	00350821012722	Grey	No	
002	0089_SW130	HDPE (no PTFE)	20 mL	00350821012988	Grey	No	
002	0089_SW130	HDPE (no PTFE)	20 mL	00350821012617	Grey	No	
002	0089_SW130	HDPE (no PTFE)	20 mL	00350821012878	Grey	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350821012507	Grey	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350821012531	Grey	No	
003	0089_PW364	Clear Plastic Bottle - Natural	500 mL	00070821039477	Green	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350821012862	Grey	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00350821012900	Grey	No	
004	0089_SW132	HDPE (no PTFE)	20 mL	00350821012519	Grey	No	
004	0089_SW132	Clear Plastic Bottle - Natural	500 mL	00070821039489	Green	No	
004	0089_SW132	HDPE (no PTFE)	20 mL	00350821012766	Grey	No	
005	0089_QC104	HDPE (no PTFE)	20 mL	00350821012600	Grey	No	
005	0089_QC104	HDPE (no PTFE)	20 mL	00350821012654	Grey	No	
005	0089_QC104	Clear Plastic Bottle - Natural	500 mL	00070821039584	Green	No	
006	0089_PW340	Clear Plastic Bottle - Natural	500 mL	00070821039551	Green	No	
006	0089_PW340	HDPE (no PTFE)	20 mL	00350821012968	Grey	No	
006	0089_PW340	HDPE (no PTFE)	20 mL	00350821012543	Grey	No	
007	0089_PW362	HDPE (no PTFE)	20 mL	00350821012546	Grey	No	
007	0089_PW362	HDPE (no PTFE)	20 mL	00350821012514	Grey	No	
007	0089_PW362	Clear Plastic Bottle - Natural	500 mL	00070821039481	Green	No	
008	0089_QC108	Clear Plastic Bottle - Natural	500 mL	00070821039461	Green	No	

CHAIN OF CUSTODY

ALS COC#: 41986 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_QC108	HDPE (no PTFE)	20 mL	00350821012763	Grey	No	
008	0089_QC108	HDPE (no PTFE)	20 mL	00350821012493	Grey	No	
009	0089_PW341	HDPE (no PTFE)	20 mL	00350821012877	Grey	No	
009	0089_PW341	HDPE (no PTFE)	20 mL	00350821012911	Grey	No	
009	0089_PW341	HDPE (no PTFE)	20 mL	00350821012594	Grey	No	
009	0089_PW341	HDPE (no PTFE)	20 mL	00350821012994	Grey	No	
009	0089_PW341	Clear Plastic Bottle - Natural	500 mL	00070821039503	Green	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350821012824	Grey	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350821012884	Grey	No	
010	0089_SW134	Clear Plastic Bottle - Natural	500 mL	00070821039566	Green	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350821012500	Grey	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00350821012488	Grey	No	
011	0089_PW363	Clear Plastic Bottle - Natural	500 mL	00070821039476	Green	No	
011	0089_PW363	HDPE (no PTFE)	20 mL	00350821012506	Grey	No	
011	0089_PW363	HDPE (no PTFE)	20 mL	00350821012561	Grey	No	
011	0089_PW363	HDPE (no PTFE)	20 mL	00350821012821	Grey	No	
011	0089_PW363	HDPE (no PTFE)	20 mL	00350821012832	Grey	No	
012	0089_SW371	HDPE (no PTFE)	20 mL	00350821012854	Grey	No	
012	0089_SW371	HDPE (no PTFE)	20 mL	00350821012848	Grey	No	
012	0089_SW371	HDPE (no PTFE)	20 mL	00350821012671	Grey	No	
012	0089_SW371	HDPE (no PTFE)	20 mL	00350821012491	Grey	No	
012	0089_SW371	Clear Plastic Bottle - Natural	500 mL	00070821039533	Green	No	
013	0089_PW368	HDPE (no PTFE)	20 mL	00350821012541	Grey	No	
013	0089_PW368	HDPE (no PTFE)	20 mL	00350821012825	Grey	No	
013	0089_PW368	Clear Plastic Bottle - Natural	500 mL	00070821057251	Green	No	
013	0089_PW368	HDPE (no PTFE)	20 mL	00350821012560	Grey	No	
013	0089_PW368	HDPE (no PTFE)	20 mL	00350821012903	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: **41986** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

014	0089_SW305	HDPE (no PTFE)	20 mL	00350821012747	Grey	No	
014	0089_SW305	HDPE (no PTFE)	20 mL	00350821012495	Grey	No	
014	0089_SW305	Clear Plastic Bottle - Natural	500 mL	00070821057231	Green	No	
015	0089_QC115	HDPE (no PTFE)	20 mL	00350821012517	Grey	No	
015	0089_QC115	HDPE (no PTFE)	20 mL	00350821013048	Grey	No	
015	0089_QC115	Clear Plastic Bottle - Natural	500 mL	00070821057254	Green	No	
016	0089_PW304	HDPE (no PTFE)	20 mL	00350821013018	Grey	No	
016	0089_PW304	HDPE (no PTFE)	20 mL	00350821012919	Grey	No	
016	0089_PW304	HDPE (no PTFE)	20 mL	00350821013077	Grey	No	
016	0089_PW304	HDPE (no PTFE)	20 mL	00350821013023	Grey	No	
016	0089_PW304	Clear Plastic Bottle - Natural	500 mL	00070821039556	Green	No	
017	0089_QC118	HDPE (no PTFE)	20 mL	00350821013063	Grey	No	
017	0089_QC118	HDPE (no PTFE)	20 mL	00350821012941	Grey	No	
017	0089_QC118	Clear Plastic Bottle - Natural	500 mL	00070821057262	Green	No	

Total Bottle Count: ALS: 67, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211344**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 41986	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 10:30	Issue Date	: 07-Sep-2022
Client Requested Due Date	: 16-Sep-2022	Scheduled Reporting Date	: **16-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 17 / 17

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211344-001	05-Sep-2022 09:14	0089_PW335_220905	✓	✓	✓	✓
EP2211344-002	05-Sep-2022 09:14	0089_SW130_220905	✓	✓	✓	✓
EP2211344-003	05-Sep-2022 09:24	0089_PW364_220905	✓	✓	✓	✓
EP2211344-004	05-Sep-2022 09:54	0089_SW132_220905	✓	✓	✓	✓
EP2211344-005	05-Sep-2022 09:56	0089_QC104_220905	✓	✓	✓	✓
EP2211344-006	05-Sep-2022 10:06	0089_PW340_220905	✓	✓	✓	✓
EP2211344-007	05-Sep-2022 10:24	0089_PW362_220905	✓	✓	✓	✓
EP2211344-008	05-Sep-2022 10:34	0089_QC108_220905	✓	✓	✓	✓
EP2211344-009	05-Sep-2022 10:53	0089_PW341_220905	✓	✓	✓	✓
EP2211344-010	05-Sep-2022 11:04	0089_SW134_220905	✓	✓	✓	✓
EP2211344-011	05-Sep-2022 11:14	0089_PW363_220905	✓	✓	✓	✓
EP2211344-012	05-Sep-2022 12:51	0089_SW371_220905	✓	✓	✓	✓
EP2211344-013	05-Sep-2022 12:54	0089_PW368_220905	✓	✓	✓	✓
EP2211344-014	05-Sep-2022 12:59	0089_SW305_220905	✓	✓	✓	✓
EP2211344-015	05-Sep-2022 13:00	0089_QC115_220905	✓	✓	✓	✓
EP2211344-016	05-Sep-2022 13:02	0089_PW304_220905	✓	✓	✓	✓
EP2211344-017	05-Sep-2022 14:04	0089_QC118_220905	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]stantec.com
- Chain of Custody (CoC) (COC) Email [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) Email [redacted]stantec.com
- EDI Format - XTab (XTAB) Email [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211344**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 09-Sep-2022
C-O-C number	: 41986	Issue Date	: 16-Sep-2022 10:06
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 17		
No. of samples analysed	: 17		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW335_220905	0089_SW130_220905	0089_PW364_220905	0089_SW132_220905	0089_QC104_220905
				Sampling date / time	05-Sep-2022 09:14	05-Sep-2022 09:14	05-Sep-2022 09:24	05-Sep-2022 09:54	05-Sep-2022 09:56
					EP2211344-001	EP2211344-002	EP2211344-003	EP2211344-004	EP2211344-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**148**	**133**	**162**	**125**	**126**
Total Alkalinity as CaCO3	----	1	mg/L		**148**	**133**	**162**	**125**	**126**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2640**	**2560**	**2610**	**2590**	**2550**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18200**	**18700**	**18000**	**18400**	**18200**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**414**	**426**	**430**	**431**	**410**
Magnesium	7439-95-4	1	mg/L		**1330**	**1380**	**1380**	**1400**	**1320**
Sodium	7440-23-5	1	mg/L		**10300**	**10800**	**10700**	**10900**	**10300**
Potassium	7440-09-7	1	mg/L		**589**	**617**	**622**	**623**	**590**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**571**	**583**	**565**	**575**	**569**
ø Total Cations	----	0.01	meq/L		**593**	**620**	**616**	**627**	**592**
ø Ionic Balance	----	0.01	%		**1.88**	**3.07**	**4.32**	**4.27**	**2.00**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW335_220905	0089_SW130_220905	0089_PW364_220905	0089_SW132_220905	0089_QC104_220905
				Sampling date / time	05-Sep-2022 09:14	05-Sep-2022 09:14	05-Sep-2022 09:24	05-Sep-2022 09:54	05-Sep-2022 09:56
Compound	CAS Number	LOR	Unit		EP2211344-001	EP2211344-002	EP2211344-003	EP2211344-004	EP2211344-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW335_220905	0089_SW130_220905	0089_PW364_220905	0089_SW132_220905	0089_QC104_220905
				Sampling date / time	05-Sep-2022 09:14	05-Sep-2022 09:14	05-Sep-2022 09:24	05-Sep-2022 09:54	05-Sep-2022 09:56
Compound	CAS Number	LOR	Unit		EP2211344-001	EP2211344-002	EP2211344-003	EP2211344-004	EP2211344-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.0**	**106**	**102**	**89.1**	**103**
13C8-PFOA	----	0.02	%		**100**	**98.6**	**104**	**98.2**	**107**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW340_220905	0089_PW362_220905	0089_QC108_220905	0089_PW341_220905	0089_SW134_220905
				Sampling date / time	05-Sep-2022 10:06	05-Sep-2022 10:24	05-Sep-2022 10:34	05-Sep-2022 10:53	05-Sep-2022 11:04
Compound	CAS Number	LOR	Unit		EP2211344-006	EP2211344-007	EP2211344-008	EP2211344-009	EP2211344-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		149	127	133	133	127
Total Alkalinity as CaCO3	----	1	mg/L		149	127	133	133	127
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2530	2600	2560	2560	2570
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18000	18200	18500	18700	18800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		439	373	416	424	424
Magnesium	7439-95-4	1	mg/L		1390	1200	1330	1370	1380
Sodium	7440-23-5	1	mg/L		10800	9330	10400	10600	10800
Potassium	7440-09-7	1	mg/L		618	528	588	611	618
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		563	570	578	583	586
ø Total Cations	----	0.01	meq/L		622	537	598	611	620
ø Ionic Balance	----	0.01	%		4.93	3.01	1.68	2.27	2.81
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	0.02	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	0.02	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW340_220905	0089_PW362_220905	0089_QC108_220905	0089_PW341_220905	0089_SW134_220905
				Sampling date / time	05-Sep-2022 10:06	05-Sep-2022 10:24	05-Sep-2022 10:34	05-Sep-2022 10:53	05-Sep-2022 11:04
Compound	CAS Number	LOR	Unit		EP2211344-006	EP2211344-007	EP2211344-008	EP2211344-009	EP2211344-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW340_220905	0089_PW362_220905	0089_QC108_220905	0089_PW341_220905	0089_SW134_220905
				Sampling date / time	05-Sep-2022 10:06	05-Sep-2022 10:24	05-Sep-2022 10:34	05-Sep-2022 10:53	05-Sep-2022 11:04
Compound	CAS Number	LOR	Unit		EP2211344-006	EP2211344-007	EP2211344-008	EP2211344-009	EP2211344-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.04**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.04**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.04**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**106**	**102**	**107**	**96.8**
13C8-PFOA	----	0.02	%		**104**	**114**	**110**	**99.8**	**101**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW363_220905	0089_SW371_220905	0089_PW368_220905	0089_SW305_220905	0089_QC115_220905
				Sampling date / time	05-Sep-2022 11:14	05-Sep-2022 12:51	05-Sep-2022 12:54	05-Sep-2022 12:59	05-Sep-2022 13:00
Compound	CAS Number	LOR	Unit		EP2211344-011	EP2211344-012	EP2211344-013	EP2211344-014	EP2211344-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		133	169	369	145	152
Total Alkalinity as CaCO3	----	1	mg/L		133	169	369	145	152
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2670	2430	414	2390	2360
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18600	17500	2270	17500	17000
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		429	400	111	386	378
Magnesium	7439-95-4	1	mg/L		1370	1260	171	1240	1210
Sodium	7440-23-5	1	mg/L		10600	9730	1270	9560	9400
Potassium	7440-09-7	1	mg/L		614	555	81	544	528
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		583	548	80.0	546	532
ø Total Cations	----	0.01	meq/L		611	561	76.9	551	541
ø Ionic Balance	----	0.01	%		2.34	1.21	1.98	0.43	0.85
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW363_220905	0089_SW371_220905	0089_PW368_220905	0089_SW305_220905	0089_QC115_220905
				Sampling date / time	05-Sep-2022 11:14	05-Sep-2022 12:51	05-Sep-2022 12:54	05-Sep-2022 12:59	05-Sep-2022 13:00
Compound	CAS Number	LOR	Unit		EP2211344-011	EP2211344-012	EP2211344-013	EP2211344-014	EP2211344-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW363_220905	0089_SW371_220905	0089_PW368_220905	0089_SW305_220905	0089_QC115_220905
				Sampling date / time	05-Sep-2022 11:14	05-Sep-2022 12:51	05-Sep-2022 12:54	05-Sep-2022 12:59	05-Sep-2022 13:00
Compound	CAS Number	LOR	Unit		EP2211344-011	EP2211344-012	EP2211344-013	EP2211344-014	EP2211344-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.6**	**105**	**108**	**98.5**	**102**
13C8-PFOA	----	0.02	%		**98.9**	**110**	**108**	**100**	**105**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW304_220905	0089_QC118_220905	----	----	----
				Sampling date / time	05-Sep-2022 13:02	05-Sep-2022 14:04	----	----	----
Compound	CAS Number	LOR	Unit		EP2211344-016	EP2211344-017	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**294**	**287**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**294**	**287**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2060**	**2050**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**15900**	**15600**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**414**	**394**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1160**	**1100**	----	----	----
Sodium	7440-23-5	1	mg/L		**8790**	**8290**	----	----	----
Potassium	7440-09-7	1	mg/L		**488**	**456**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**497**	**488**	----	----	----
ø Total Cations	----	0.01	meq/L		**511**	**482**	----	----	----
ø Ionic Balance	----	0.01	%		**1.36**	**0.62**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.02**	**0.01**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	**0.02**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW304_220905	0089_QC118_220905	----	----	----
			Sampling date / time	05-Sep-2022 13:02	05-Sep-2022 14:04	----	----	----
Compound	CAS Number	LOR	Unit	EP2211344-016	EP2211344-017	--------	--------	--------
				Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW304_220905	0089_QC118_220905	----	----	----
				Sampling date / time	05-Sep-2022 13:02	05-Sep-2022 14:04	----	----	----
Compound	CAS Number	LOR	Unit		EP2211344-016	EP2211344-017	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.04**	**0.03**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.04**	**0.03**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.04**	**0.03**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.4**	**102**	----	----	----
13C8-PFOA	----	0.02	%		**106**	**102**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211344**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 09-Sep-2022
C-O-C number	: 41986	Issue Date	: 16-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 17		
No. of samples analysed	: 17		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4576913)									
EP2211088-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	132	134	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	132	134	1.5	0% - 20%
EP2211290-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	251	241	4.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	251	241	4.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4576916)									
EP2211344-011	0089_PW363_220905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	133	136	2.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	133	136	2.4	0% - 20%
EP2211386-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	394	403	2.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	394	403	2.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4566528)									
EP2211344-001	0089_PW335_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2640	2640	0.1	0% - 20%
EP2211344-011	0089_PW363_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2670	2620	1.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4566527)									
EP2211344-001	0089_PW335_220905	ED045G: Chloride	16887-00-6	1	mg/L	18200	18400	0.9	0% - 20%
EP2211344-011	0089_PW363_220905	ED045G: Chloride	16887-00-6	1	mg/L	18600	18800	1.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4566414)									
EP2211344-001	0089_PW335_220905	ED093F: Calcium	7440-70-2	1	mg/L	414	420	1.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1330	1360	2.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10300	10600	2.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	589	608	3.2	0% - 20%
EP2211344-011	0089_PW363_220905	ED093F: Calcium	7440-70-2	1	mg/L	429	425	0.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1370	1370	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10600	10800	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	614	615	0.3	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4576994)									
EP2211344-009	0089_PW341_220905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2211344-011	0089_PW363_220905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4576994)									
EP2211344-009	0089_PW341_220905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2211344-011	0089_PW363_220905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4576994) - continued									
EP2211344-011	0089_PW363_220905	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4576994)									
EP2211344-009	0089_PW341_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211344-011	0089_PW363_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4576994)									
EP2211344-009	0089_PW341_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4576994) - continued									
EP2211344-011	0089_PW363_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4576994)									
EP2211344-009	0089_PW341_220905	EP231X: Sum of PFAS	----	0.01	µg/L	0.04	0.04	0.0	No Limit
EP2211344-011	0089_PW363_220905	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.01	66.7	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4576913)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	87.8	118
				<1	200 mg/L	92.2	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4576916)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	103	87.8	118
				<1	200 mg/L	99.3	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566528)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4566527)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.1	88.6	113
				<1	1000 mg/L	99.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4566414)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.1	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	113	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.8	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4576994)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	98.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	97.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	98.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4576994)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4576994) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	117	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	107	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	118	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4576994)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	110	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	123	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	127	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	114	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	97.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4576994)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	139	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	91.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	116	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	102	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566528)							
EP2211344-001	0089_PW335_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4566527)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 4566527) - continued							
EP2211344-001	0089_PW335_220905	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4576994)							
EP2211344-010	0089_SW134_220905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	91.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	95.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	96.2	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	112	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	102	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4576994)							
EP2211344-010	0089_SW134_220905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	117	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	112	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	119	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	111	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	112	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	119	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	124	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	130	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	119	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4576994)							
EP2211344-010	0089_SW134_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	108	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	101	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	102	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	118	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	119	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	122	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	107	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4576994)							
EP2211344-010	0089_SW134_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	104	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	98.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	103	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4576994) - continued							
EP2211344-010	0089_SW134_220905	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	105	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211344**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SW/PW - JS	Issue Date	: 16-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 17
Order number	: pfas-omp/Stirling	No. of samples analysed	: 17

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211344--001	0089_PW335_220905	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2211344--001	0089_PW335_220905	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW335_220905, 0089_PW364_220905, 0089_QC104_220905, 0089_PW362_220905, 0089_PW341_220905, 0089_PW363_220905, 0089_PW368_220905, 0089_QC115_220905, 0089_QC118_220905, 0089_SW130_220905, 0089_SW132_220905, 0089_PW340_220905, 0089_QC108_220905, 0089_SW134_220905, 0089_SW371_220905, 0089_SW305_220905, 0089_PW304_220905,	**05-Sep-2022**	**----**	----	----	**13-Sep-2022**	19-Sep-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW335_220905, 0089_SW130_220905, 0089_PW364_220905, 0089_SW132_220905, 0089_QC104_220905, 0089_PW340_220905, 0089_PW362_220905, 0089_QC108_220905, 0089_PW341_220905, 0089_SW134_220905, 0089_PW363_220905, 0089_SW371_220905, 0089_PW368_220905, 0089_SW305_220905, 0089_QC115_220905, 0089_PW304_220905, 0089_QC118_220905	**05-Sep-2022**	**----**	----	----	**13-Sep-2022**	03-Oct-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW335_220905, 0089_SW130_220905, 0089_PW364_220905, 0089_SW132_220905, 0089_QC104_220905, 0089_PW340_220905, 0089_PW362_220905, 0089_QC108_220905, 0089_PW341_220905, 0089_SW134_220905, 0089_PW363_220905, 0089_SW371_220905, 0089_PW368_220905, 0089_SW305_220905, 0089_QC115_220905, 0089_PW304_220905, 0089_QC118_220905	**05-Sep-2022**	**----**	----	----	**13-Sep-2022**	03-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW335_220905, 0089_SW130_220905, 0089_PW364_220905, 0089_SW132_220905, 0089_QC104_220905, 0089_PW340_220905, 0089_PW362_220905, 0089_QC108_220905, 0089_PW341_220905, 0089_SW134_220905, 0089_PW363_220905, 0089_SW371_220905, 0089_PW368_220905, 0089_SW305_220905, 0089_QC115_220905, 0089_PW304_220905, 0089_QC118_220905	**05-Sep-2022**	**----**	----	----	**12-Sep-2022**	12-Sep-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW335_220905, 0089_SW130_220905, 0089_PW364_220905, 0089_SW132_220905, 0089_QC104_220905, 0089_PW340_220905, 0089_PW362_220905, 0089_QC108_220905, 0089_PW341_220905, 0089_SW134_220905, 0089_PW363_220905, 0089_SW371_220905, 0089_PW368_220905, 0089_SW305_220905, 0089_QC115_220905, 0089_PW304_220905, 0089_QC118_220905	**05-Sep-2022**	**13-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW335_220905, 0089_SW130_220905, 0089_PW364_220905, 0089_SW132_220905, 0089_QC104_220905, 0089_PW340_220905, 0089_PW362_220905, 0089_QC108_220905, 0089_PW341_220905, 0089_SW134_220905, 0089_PW363_220905, 0089_SW371_220905, 0089_PW368_220905, 0089_SW305_220905, 0089_QC115_220905, 0089_PW304_220905, 0089_QC118_220905	**05-Sep-2022**	**13-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW335_220905, 0089_SW130_220905, 0089_PW364_220905, 0089_SW132_220905, 0089_QC104_220905, 0089_PW340_220905, 0089_PW362_220905, 0089_QC108_220905, 0089_PW341_220905, 0089_SW134_220905, 0089_PW363_220905, 0089_SW371_220905, 0089_PW368_220905, 0089_SW305_220905, 0089_QC115_220905, 0089_PW304_220905, 0089_QC118_220905	**05-Sep-2022**	**13-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW335_220905, 0089_SW130_220905, 0089_PW364_220905, 0089_SW132_220905, 0089_QC104_220905, 0089_PW340_220905, 0089_PW362_220905, 0089_QC108_220905, 0089_PW341_220905, 0089_SW134_220905, 0089_PW363_220905, 0089_SW371_220905, 0089_PW368_220905, 0089_SW305_220905, 0089_QC115_220905, 0089_PW304_220905, 0089_QC118_220905	**05-Sep-2022**	**13-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW335_220905, 0089_SW130_220905, 0089_PW364_220905, 0089_SW132_220905, 0089_QC104_220905, 0089_PW340_220905, 0089_PW362_220905, 0089_QC108_220905, 0089_PW341_220905, 0089_SW134_220905, 0089_PW363_220905, 0089_SW371_220905, 0089_PW368_220905, 0089_SW305_220905, 0089_QC115_220905, 0089_PW304_220905, 0089_QC118_220905	**05-Sep-2022**	**13-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: **41987** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW124		05/09/2022 09:15 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_QC102		05/09/2022 09:32 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_MW125		05/09/2022 09:43 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
004	0089_MW126		05/09/2022 10:41 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
005	0089_MW127		05/09/2022 11:33 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_QC113		05/09/2022 11:34 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW202		05/09/2022 12:50 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_MW289		05/09/2022 02:34 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: **41987** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW124	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_QC102	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW125	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW126	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW127	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_QC113	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW202	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW289	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 41987 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW124	Clear Plastic Bottle - Natural	500 mL	00070821039600	Green	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350821012533	Grey	No	
001	0089_MW124	HDPE (no PTFE)	20 mL	00350821013003	Grey	No	
002	0089_QC102	Clear Plastic Bottle - Natural	500 mL	00070821041333	Green	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00350821012652	Grey	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00350821012521	Grey	No	
003	0089_MW125	HDPE (no PTFE)	20 mL	00350821012989	Grey	No	
003	0089_MW125	HDPE (no PTFE)	20 mL	00350821012813	Grey	No	
003	0089_MW125	HDPE (no PTFE)	20 mL	00350821012764	Grey	No	
003	0089_MW125	HDPE (no PTFE)	20 mL	00350821013076	Grey	No	
003	0089_MW125	Clear Plastic Bottle - Natural	500 mL	00070821039499	Green	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350821013043	Grey	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350821012793	Grey	No	
004	0089_MW126	Clear Plastic Bottle - Natural	500 mL	00070821039492	Green	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350821012487	Grey	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00350821012771	Grey	No	
005	0089_MW127	Clear Plastic Bottle - Natural	500 mL	00070821039575	Green	No	
005	0089_MW127	HDPE (no PTFE)	20 mL	00350821012611	Grey	No	
005	0089_MW127	HDPE (no PTFE)	20 mL	00350821013001	Grey	No	
006	0089_QC113	Clear Plastic Bottle - Natural	500 mL	00070821039563	Green	No	
006	0089_QC113	HDPE (no PTFE)	20 mL	00350821012494	Grey	No	
006	0089_QC113	HDPE (no PTFE)	20 mL	00350821012592	Grey	No	
007	0089_MW202	Clear Plastic Bottle - Natural	500 mL	00070821057268	Green	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00350821012499	Grey	No	
007	0089_MW202	HDPE (no PTFE)	20 mL	00350821012502	Grey	No	
008	0089_MW289	HDPE (no PTFE)	20 mL	00350821012901	Grey	No	

CHAIN OF CUSTODY

ALS COC#: **41987** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_MW289	HDPE (no PTFE)	20 mL	00350821012996	Grey	No	
008	0089_MW289	HDPE (no PTFE)	20 mL	00350821012819	Grey	No	
008	0089_MW289	HDPE (no PTFE)	20 mL	00350821013073	Grey	No	
008	0089_MW289	Clear Plastic Bottle - Natural	500 mL	00070821039595	Green	No	

Total Bottle Count: ALS: 30, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211345**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 41987	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 10:30	Issue Date	: 07-Sep-2022
Client Requested Due Date	: 16-Sep-2022	Scheduled Reporting Date	: **16-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211345-001	05-Sep-2022 09:15	0089_MW124_220905	✓	✓	✓	✓
EP2211345-002	05-Sep-2022 09:32	0089_QC102_220905	✓	✓	✓	✓
EP2211345-003	05-Sep-2022 09:43	0089_MW125_220905	✓	✓	✓	✓
EP2211345-004	05-Sep-2022 10:41	0089_MW126_220905	✓	✓	✓	✓
EP2211345-005	05-Sep-2022 11:33	0089_MW127_220905	✓	✓	✓	✓
EP2211345-006	05-Sep-2022 11:34	0089_QC113_220905	✓	✓	✓	✓
EP2211345-007	05-Sep-2022 12:50	0089_MW202_220905	✓	✓	✓	✓
EP2211345-008	05-Sep-2022 14:34	0089_MW289_220905	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211345**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2022
C-O-C number	: 41987	Issue Date	: 16-Sep-2022 10:04
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW124_220905	0089_QC102_220905	0089_MW125_220905	0089_MW126_220905	0089_MW127_220905
				Sampling date / time	05-Sep-2022 09:15	05-Sep-2022 09:32	05-Sep-2022 09:43	05-Sep-2022 10:41	05-Sep-2022 11:33
					EP2211345-001	EP2211345-002	EP2211345-003	EP2211345-004	EP2211345-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**416**	**408**	**433**	**682**	**509**
Total Alkalinity as CaCO3	----	1	mg/L		**416**	**408**	**433**	**682**	**509**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1840**	**1840**	**1900**	**1400**	**1550**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**15000**	**14700**	**15400**	**15400**	**14200**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**450**	**444**	**466**	**408**	**383**
Magnesium	7439-95-4	1	mg/L		**1110**	**1110**	**1220**	**1130**	**1070**
Sodium	7440-23-5	1	mg/L		**8340**	**8240**	**8800**	**7850**	**7230**
Potassium	7440-09-7	1	mg/L		**433**	**431**	**469**	**397**	**369**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**470**	**461**	**483**	**477**	**443**
ø Total Cations	----	0.01	meq/L		**488**	**483**	**518**	**465**	**431**
ø Ionic Balance	----	0.01	%		**1.87**	**2.31**	**3.58**	**1.30**	**1.36**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.14**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.12**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	**0.49**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	**0.01**	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	**0.03**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.13**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_220905	0089_QC102_220905	0089_MW125_220905	0089_MW126_220905	0089_MW127_220905
				Sampling date / time	05-Sep-2022 09:15	05-Sep-2022 09:32	05-Sep-2022 09:43	05-Sep-2022 10:41	05-Sep-2022 11:33
Compound	CAS Number	LOR	Unit		EP2211345-001	EP2211345-002	EP2211345-003	EP2211345-004	EP2211345-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW124_220905	0089_QC102_220905	0089_MW125_220905	0089_MW126_220905	0089_MW127_220905
				Sampling date / time	05-Sep-2022 09:15	05-Sep-2022 09:32	05-Sep-2022 09:43	05-Sep-2022 10:41	05-Sep-2022 11:33
Compound	CAS Number	LOR	Unit		EP2211345-001	EP2211345-002	EP2211345-003	EP2211345-004	EP2211345-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**0.92**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.50**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.80**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.3**	**93.8**	**92.7**	**101**	**93.3**
13C8-PFOA	----	0.02	%		**103**	**101**	**101**	**97.2**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC113_220905	0089_MW202_220905	0089_MW289_220905	----	----
				Sampling date / time	05-Sep-2022 11:34	05-Sep-2022 12:50	05-Sep-2022 14:34	----	----
Compound	CAS Number	LOR	Unit		EP2211345-006	EP2211345-007	EP2211345-008	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**509**	**411**	**306**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**509**	**411**	**306**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1550**	**112**	**42**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**13400**	**548**	**79**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**411**	**121**	**82**	----	----
Magnesium	7439-95-4	1	mg/L		**1160**	**51**	**20**	----	----
Sodium	7440-23-5	1	mg/L		**7810**	**287**	**73**	----	----
Potassium	7440-09-7	1	mg/L		**400**	**31**	**6**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**420**	**26.0**	**9.22**	----	----
ø Total Cations	----	0.01	meq/L		**466**	**23.5**	**9.07**	----	----
ø Ionic Balance	----	0.01	%		**5.13**	**5.03**	**0.82**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.07**	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.07**	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.03**	**0.59**	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	**0.03**	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.04**	**1.61**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	**0.04**	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.08**	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.02**	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC113_220905	0089_MW202_220905	0089_MW289_220905	----	----
				Sampling date / time	05-Sep-2022 11:34	05-Sep-2022 12:50	05-Sep-2022 14:34	----	----
Compound	CAS Number	LOR	Unit		EP2211345-006	EP2211345-007	EP2211345-008	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.04**	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC113_220905	0089_MW202_220905	0089_MW289_220905	----	----
				Sampling date / time	05-Sep-2022 11:34	05-Sep-2022 12:50	05-Sep-2022 14:34	----	----
Compound	CAS Number	LOR	Unit		EP2211345-006	EP2211345-007	EP2211345-008	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.07**	**2.55**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.07**	**2.20**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.07**	**2.45**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.3**	**96.4**	**97.4**	----	----
13C8-PFOA	----	0.02	%		**97.7**	**101**	**101**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211345**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2022
C-O-C number	: 41987	Issue Date	: 16-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
No. of samples analysed	: 8		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4580057)									
EP2211345-002	0089_QC102_220905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	408	421	3.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	408	421	3.3	0% - 20%
EP2211387-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	287	285	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	287	285	0.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4566531)									
EP2211345-001	0089_MW124_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1840	1830	0.5	0% - 20%
EP2211347-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2670	2600	2.7	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4566530)									
EP2211345-001	0089_MW124_220905	ED045G: Chloride	16887-00-6	1	mg/L	15000	14700	2.0	0% - 20%
EP2211347-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18300	21400	15.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4566417)									
EP2211345-001	0089_MW124_220905	ED093F: Calcium	7440-70-2	1	mg/L	450	448	0.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1110	1120	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	8340	8410	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	433	440	1.5	0% - 20%
EP2211347-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	430	438	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1400	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10700	10900	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	495	502	1.5	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4577645)									
EP2211345-003	0089_MW125_220905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.49	0.52	6.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.13	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2232335-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4577645)									
EP2211345-003	0089_MW125_220905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.13	0.14	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
ES2232335-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4577645)									
EP2211345-003	0089_MW125_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4577645) - continued									
EP2211345-003	0089_MW125_220905	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2232335-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4577645)									
EP2211345-003	0089_MW125_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2232335-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4577645)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4577645) - continued									
EP2211345-003	0089_MW125_220905	EP231X: Sum of PFAS	----	0.01	µg/L	0.92	0.97	5.3	0% - 20%
ES2232335-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.04	28.6	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4580057)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	87.8	118
				<1	200 mg/L	99.1	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566531)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	93.8	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4566530)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.0	88.6	113
				<1	1000 mg/L	98.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4566417)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	109	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	111	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4577645)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	103	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	101	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	113	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4577645)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	116	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	129	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	118	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	117	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4577645) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	120	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4577645)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	117	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	136	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	116	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	122	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	118	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	117	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	113	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4577645)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	112	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	120	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	118	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566531)							
EP2211345-001	0089_MW124_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4566530)							
EP2211345-001	0089_MW124_220905	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4577645)							
EP2211345-008	0089_MW289_220905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	114	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	105	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	111	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	96.8	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4577645) - continued							
EP2211345-008	0089_MW289_220905	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	97.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4577645)							
EP2211345-008	0089_MW289_220905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	116	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	111	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	110	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	122	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	115	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	104	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	117	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	113	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	98.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	123	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4577645)							
EP2211345-008	0089_MW289_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	119	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	130	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	128	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	120	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	134	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	108	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	107	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4577645)							
EP2211345-008	0089_MW289_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	117	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	116	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	114	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211345**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling GW - JS	Issue Date	: 16-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 8
Order number	: pfas-omp/Stirling	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211345--001	0089_MW124_220905	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2211345--001	0089_MW124_220905	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2211345--008	0089_MW289_220905	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW124_220905,	0089_QC102_220905,	**05-Sep-2022**	**----**	----	----	**14-Sep-2022**	19-Sep-2022	✓
0089_MW125_220905,	0089_MW126_220905,							
0089_MW127_220905,	0089_QC113_220905,							
0089_MW202_220905,	0089_MW289_220905							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW124_220905,	0089_QC102_220905,	**05-Sep-2022**	**----**	----	----	**14-Sep-2022**	03-Oct-2022	✓
0089_MW125_220905,	0089_MW126_220905,							
0089_MW127_220905,	0089_QC113_220905,							
0089_MW202_220905,	0089_MW289_220905							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW124_220905,	0089_QC102_220905,	**05-Sep-2022**	**----**	----	----	**14-Sep-2022**	03-Oct-2022	✓
0089_MW125_220905,	0089_MW126_220905,							
0089_MW127_220905,	0089_QC113_220905,							
0089_MW202_220905,	0089_MW289_220905							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW124_220905, 0089_QC102_220905, 0089_MW125_220905, 0089_MW126_220905, 0089_MW127_220905, 0089_QC113_220905, 0089_MW202_220905, 0089_MW289_220905	**05-Sep-2022**	**----**	----	----	**08-Sep-2022**	12-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_220905, 0089_QC102_220905, 0089_MW125_220905, 0089_MW126_220905, 0089_MW127_220905, 0089_QC113_220905, 0089_MW202_220905, 0089_MW289_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_220905, 0089_QC102_220905, 0089_MW125_220905, 0089_MW126_220905, 0089_MW127_220905, 0089_QC113_220905, 0089_MW202_220905, 0089_MW289_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW124_220905, 0089_QC102_220905, 0089_MW125_220905, 0089_MW126_220905, 0089_MW127_220905, 0089_QC113_220905, 0089_MW202_220905, 0089_MW289_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW124_220905, 0089_QC102_220905, 0089_MW125_220905, 0089_MW126_220905, 0089_MW127_220905, 0089_QC113_220905, 0089_MW202_220905, 0089_MW289_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW124_220905, 0089_QC102_220905, 0089_MW125_220905, 0089_MW126_220905, 0089_MW127_220905, 0089_QC113_220905, 0089_MW202_220905, 0089_MW289_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	04-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 41988 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD335		05/09/2022 09:13 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD364		05/09/2022 09:23 AM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD340		05/09/2022 10:07 AM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_QC105		05/09/2022 10:08 AM	Soil	ALS: 1 Non ALS: 0	No	X		
005	0089_SD362		05/09/2022 10:23 AM	Soil	ALS: 1 Non ALS: 0	No	X		
006	0089_SD341		05/09/2022 10:53 AM	Soil	ALS: 1 Non ALS: 0	No	X		
007	0089_SD363		05/09/2022 11:16 AM	Soil	ALS: 1 Non ALS: 0	No	X		
008	0089_SD368		05/09/2022 12:55 PM	Soil	ALS: 1 Non ALS: 0	No	X		
009	0089_SD304		05/09/2022 01:03 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **41988** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD335	HDPE Soil Jar	200 mL	00620322012188	Grey	No	
002	0089_SD364	HDPE Soil Jar	200 mL	00620322012291	Grey	No	
003	0089_SD340	HDPE Soil Jar	200 mL	00620322012256	Grey	No	
004	0089_QC105	HDPE Soil Jar	200 mL	00620322012283	Grey	No	
005	0089_SD362	HDPE Soil Jar	200 mL	00620322012292	Grey	No	
006	0089_SD341	HDPE Soil Jar	200 mL	00620322012259	Grey	No	
007	0089_SD363	HDPE Soil Jar	200 mL	00620322012276	Grey	No	
008	0089_SD368	HDPE Soil Jar	200 mL	00620322012251	Grey	No	
009	0089_SD304	HDPE Soil Jar	200 mL	00620322012262	Grey	No	

Total Bottle Count: ALS: 9, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2211346**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 41988	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 10:30	Issue Date	: 07-Sep-2022
Client Requested Due Date	: 16-Sep-2022	Scheduled Reporting Date	: **16-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2211346-001	05-Sep-2022 09:13	0089_SD335_220905	✓	✓
EP2211346-002	05-Sep-2022 09:23	0089_SD364_220905	✓	✓
EP2211346-003	05-Sep-2022 10:07	0089_SD340_220905	✓	✓
EP2211346-004	05-Sep-2022 10:08	0089_QC105_220905	✓	✓
EP2211346-005	05-Sep-2022 10:23	0089_SD362_220905	✓	✓
EP2211346-006	05-Sep-2022 10:53	0089_SD341_220905	✓	✓
EP2211346-007	05-Sep-2022 11:16	0089_SD363_220905	✓	✓
EP2211346-008	05-Sep-2022 12:55	0089_SD368_220905	✓	✓
EP2211346-009	05-Sep-2022 13:03	0089_SD304_220905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]stantec.com
- Chain of Custody (CoC) (COC) Email [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) Email [redacted]stantec.com
- EDI Format - XTab (XTAB) Email [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211346**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Sep-2022
C-O-C number	: 41988	Issue Date	: 16-Sep-2022 15:18
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD335_220905	0089_SD364_220905	0089_SD340_220905	0089_QC105_220905	0089_SD362_220905
				Sampling date / time	05-Sep-2022 09:13	05-Sep-2022 09:23	05-Sep-2022 10:07	05-Sep-2022 10:08	05-Sep-2022 10:23
					EP2211346-001	EP2211346-002	EP2211346-003	EP2211346-004	EP2211346-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**30.7**	**27.2**	**25.5**	**23.1**	**25.7**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_220905	0089_SD364_220905	0089_SD340_220905	0089_QC105_220905	0089_SD362_220905
				Sampling date / time	05-Sep-2022 09:13	05-Sep-2022 09:23	05-Sep-2022 10:07	05-Sep-2022 10:08	05-Sep-2022 10:23
Compound	CAS Number	LOR	Unit		EP2211346-001	EP2211346-002	EP2211346-003	EP2211346-004	EP2211346-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**106**	**108**	**94.0**	**93.5**
13C8-PFOA	----	0.0002	%		**101**	**101**	**106**	**99.5**	**98.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD341_220905	0089_SD363_220905	0089_SD368_220905	0089_SD304_220905	----
			Sampling date / time	05-Sep-2022 10:53	05-Sep-2022 11:16	05-Sep-2022 12:55	05-Sep-2022 13:03	----
Compound	CAS Number	LOR	Unit	EP2211346-006	EP2211346-007	EP2211346-008	EP2211346-009	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**28.9**	**30.5**	**43.6**	**32.7**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0004**	**0.0005**	<0.0002	<0.0002	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD341_220905	0089_SD363_220905	0089_SD368_220905	0089_SD304_220905	----
				Sampling date / time	05-Sep-2022 10:53	05-Sep-2022 11:16	05-Sep-2022 12:55	05-Sep-2022 13:03	----
Compound	CAS Number	LOR	Unit		EP2211346-006	EP2211346-007	EP2211346-008	EP2211346-009	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0004**	**0.0005**	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0004**	**0.0005**	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0004**	**0.0005**	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**106**	**84.0**	**76.0**	**87.5**	----
13C8-PFOA	----	0.0002	%		**112**	**95.5**	**110**	**94.5**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211346**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Sep-2022
C-O-C number	: 41988	Issue Date	: 16-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4580164)									
EP2211342-003	Anonymous	EA055: Moisture Content	----	0.1	%	29.8	28.6	4.1	0% - 20%
EP2211346-009	0089_SD304_220905	EA055: Moisture Content	----	0.1	%	32.7	34.5	5.6	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4578519)									
EP2211267-069	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2211342-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0004	0.0003	29.1	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4579871)									
EP2211346-004	0089_QC105_220905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2211348-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4579871) - continued									
EP2211348-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4578519)									
EP2211267-069	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2211342-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4579871)									
EP2211346-004	0089_QC105_220905	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2211348-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4579871) - continued									
EP2211348-005	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4578519)									
EP2211267-069	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211342-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4579871)									
EP2211346-004	0089_QC105_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4579871) - continued									
EP2211346-004	0089_QC105_220905	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211348-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4578519)									
EP2211267-069	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211342-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4579871)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4579871) - continued									
EP2211346-004	0089_QC105_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211348-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4578519)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4579871)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	123	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4578519)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	118	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4579871)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	104	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	127	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	64.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4579871) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578519)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4579871)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	127	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	120	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578519)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	110	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	117	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	120	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	116	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4579871)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	122	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.6	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4578519)							
EP2211267-069	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	113	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	117	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	106	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	122	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	126	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	115	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4579871)							
EP2211346-004	0089_QC105_220905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	107	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	101	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	104	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	107	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	88.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4578519)							
EP2211267-069	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	117	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	122	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	114	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	119	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	123	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	122	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	118	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	121	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	122	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	116	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	120	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4579871)							
EP2211346-004	0089_QC105_220905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	123	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	107	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	111	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	123	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	128	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	114	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	103	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	114	64.0	136

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4579871) - continued							
EP2211346-004	0089_QC105_220905	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	111	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	98.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578519)							
EP2211267-069	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	110	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	108	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	109	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	127	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	107	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	117	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	114	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4579871)							
EP2211346-004	0089_QC105_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	121	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	126	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	122	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	110	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	117	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	105	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	119	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578519)							
EP2211267-069	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	128	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	119	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	118	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	117	69.2	143
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4579871)							
EP2211346-004	0089_QC105_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	104	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	140	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	113	65.0	137

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4579871) - continued							
EP2211346-004	0089_QC105_220905	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	126	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211346**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SD - JS	Issue Date	: 16-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD335_220905, 0089_SD364_220905, 0089_SD340_220905, 0089_QC105_220905, 0089_SD362_220905, 0089_SD341_220905, 0089_SD363_220905, 0089_SD368_220905, 0089_SD304_220905	**05-Sep-2022**	**----**	----	----	**14-Sep-2022**	19-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_220905, 0089_SD364_220905, 0089_SD340_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓
HDPE Soil Jar (EP231X)							
0089_QC105_220905, 0089_SD362_220905, 0089_SD341_220905, 0089_SD363_220905, 0089_SD368_220905, 0089_SD304_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_220905, 0089_SD364_220905, 0089_SD340_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓
HDPE Soil Jar (EP231X)							
0089_QC105_220905, 0089_SD362_220905, 0089_SD341_220905, 0089_SD363_220905, 0089_SD368_220905, 0089_SD304_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD335_220905, 0089_SD364_220905, 0089_SD340_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓
HDPE Soil Jar (EP231X)							
0089_QC105_220905, 0089_SD362_220905, 0089_SD341_220905, 0089_SD363_220905, 0089_SD368_220905, 0089_SD304_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) 0089_SD335_220905, 0089_SD364_220905, 0089_SD340_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓
HDPE Soil Jar (EP231X) 0089_QC105_220905, 0089_SD362_220905, 0089_SD341_220905, 0089_SD363_220905, 0089_SD368_220905, 0089_SD304_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) 0089_SD335_220905, 0089_SD364_220905, 0089_SD340_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**14-Sep-2022**	24-Oct-2022	✓
HDPE Soil Jar (EP231X) 0089_QC105_220905, 0089_SD362_220905, 0089_SD341_220905, 0089_SD363_220905, 0089_SD368_220905, 0089_SD304_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 41999 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW150		05/09/2022 09:46 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_SW152		05/09/2022 09:58 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_QC103		05/09/2022 09:59 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW154		05/09/2022 10:05 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_SW156		05/09/2022 10:11 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
006	0089_PW356		05/09/2022 10:32 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW331		05/09/2022 10:46 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_QC106		05/09/2022 10:46 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		extra PFAS bottles for lab QC
009	0089_PW357		05/09/2022 10:58 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

(ALS) *COC#:* **41999** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW330		05/09/2022 11:11 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_PW358		05/09/2022 11:20 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_PW329		05/09/2022 11:28 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: **41999** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW150	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_SW152	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_QC103	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW154	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW156	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW356	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW331	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_QC106	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW357	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: **41999** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_PW330	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_PW358	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_PW329	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 41999 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW150	Clear Plastic Bottle - Natural	500 mL	00070821039544	Green	No	
001	0089_SW150	HDPE (no PTFE)	20 mL	00350821012563	Grey	No	
001	0089_SW150	HDPE (no PTFE)	20 mL	00350821012511	Grey	No	
002	0089_SW152	Clear Plastic Bottle - Natural	500 mL	00070821039576	Green	No	
002	0089_SW152	HDPE (no PTFE)	20 mL	00350821012620	Grey	No	
002	0089_SW152	HDPE (no PTFE)	20 mL	00350821012639	Grey	No	
003	0089_QC103	Clear Plastic Bottle - Natural	500 mL	00070821039523	Green	No	
003	0089_QC103	HDPE (no PTFE)	20 mL	00350821012503	Grey	No	
003	0089_QC103	HDPE (no PTFE)	20 mL	00350821012939	Grey	No	
004	0089_SW154	HDPE (no PTFE)	20 mL	00350821013070	Grey	No	
004	0089_SW154	HDPE (no PTFE)	20 mL	00350821012485	Grey	No	
004	0089_SW154	Clear Plastic Bottle - Natural	500 mL	00070821039447	Green	No	
005	0089_SW156	HDPE (no PTFE)	20 mL	00350821012513	Grey	No	
005	0089_SW156	HDPE (no PTFE)	20 mL	00350821012603	Grey	No	
005	0089_SW156	HDPE (no PTFE)	20 mL	00350821012680	Grey	No	
005	0089_SW156	HDPE (no PTFE)	20 mL	00350821012512	Grey	No	
005	0089_SW156	Clear Plastic Bottle - Natural	500 mL	00070821039596	Green	No	
006	0089_PW356	Clear Plastic Bottle - Natural	500 mL	00070821039558	Green	No	
006	0089_PW356	HDPE (no PTFE)	20 mL	00350821013006	Grey	No	
006	0089_PW356	HDPE (no PTFE)	20 mL	00350821013034	Grey	No	
007	0089_PW331	Clear Plastic Bottle - Natural	500 mL	00070821057219	Green	No	
007	0089_PW331	HDPE (no PTFE)	20 mL	00350821012867	Grey	No	
007	0089_PW331	HDPE (no PTFE)	20 mL	00350821012881	Grey	No	
008	0089_QC106	HDPE (no PTFE)	20 mL	00350821012806	Grey	No	
008	0089_QC106	HDPE (no PTFE)	20 mL	00350821012929	Grey	No	
008	0089_QC106	Clear Plastic Bottle - Natural	500 mL	00070821039594	Green	No	

CHAIN OF CUSTODY

ALS COC#: 41999 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

008	0089_QC106	HDPE (no PTFE)	20 mL	00350821013064	Grey	No	
008	0089_QC106	HDPE (no PTFE)	20 mL	00350821013072	Grey	No	
009	0089_PW357	HDPE (no PTFE)	20 mL	00350821012791	Grey	No	
009	0089_PW357	Clear Plastic Bottle - Natural	500 mL	00070821039552	Green	No	
009	0089_PW357	HDPE (no PTFE)	20 mL	00350821012866	Grey	No	
010	0089_PW330	HDPE (no PTFE)	20 mL	00350821012918	Grey	No	
010	0089_PW330	HDPE (no PTFE)	20 mL	00350821012795	Grey	No	
010	0089_PW330	Clear Plastic Bottle - Natural	500 mL	00070821039518	Green	No	
011	0089_PW358	Clear Plastic Bottle - Natural	500 mL	00070821057222	Green	No	
011	0089_PW358	HDPE (no PTFE)	20 mL	00350821012885	Grey	No	
011	0089_PW358	HDPE (no PTFE)	20 mL	00350821012982	Grey	No	
012	0089_PW329	Clear Plastic Bottle - Natural	500 mL	00070821039590	Green	No	
012	0089_PW329	HDPE (no PTFE)	20 mL	00350821012945	Grey	No	
012	0089_PW329	HDPE (no PTFE)	20 mL	00350821012882	Grey	No	

Total Bottle Count: ALS: 40, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211347**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 41999	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 10:30	Issue Date	: 07-Sep-2022
Client Requested Due Date	: 19-Sep-2022	Scheduled Reporting Date	: **19-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211347-001	05-Sep-2022 09:46	0089_SW150_220905	✓	✓	✓	✓
EP2211347-002	05-Sep-2022 09:58	0089_SW152_220905	✓	✓	✓	✓
EP2211347-003	05-Sep-2022 09:59	0089_QC103_220905	✓	✓	✓	✓
EP2211347-004	05-Sep-2022 10:05	0089_SW154_220905	✓	✓	✓	✓
EP2211347-005	05-Sep-2022 10:11	0089_SW156_220905	✓	✓	✓	✓
EP2211347-006	05-Sep-2022 10:32	0089_PW356_220905	✓	✓	✓	✓
EP2211347-007	05-Sep-2022 10:46	0089_PW331_220905	✓	✓	✓	✓
EP2211347-008	05-Sep-2022 10:46	0089_QC106_220905	✓	✓	✓	✓
EP2211347-009	05-Sep-2022 10:58	0089_PW357_220905	✓	✓	✓	✓
EP2211347-010	05-Sep-2022 11:11	0089_PW330_220905	✓	✓	✓	✓
EP2211347-011	05-Sep-2022 11:20	0089_PW358_220905	✓	✓	✓	✓
EP2211347-012	05-Sep-2022 11:28	0089_PW329_220905	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) Email [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]stantec.com
- Chain of Custody (CoC) (COC) Email [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) Email [redacted]stantec.com
- EDI Format - XTab (XTAB) Email [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211347**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2022
C-O-C number	: 41999	Issue Date	: 19-Sep-2022 18:01
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW150_220905	0089_SW152_220905	0089_QC103_220905	0089_SW154_220905	0089_SW156_220905
				Sampling date / time	05-Sep-2022 09:46	05-Sep-2022 09:58	05-Sep-2022 09:59	05-Sep-2022 10:05	05-Sep-2022 10:11
					EP2211347-001	EP2211347-002	EP2211347-003	EP2211347-004	EP2211347-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**125**	**122**	**122**	**122**	**122**
Total Alkalinity as CaCO3	----	1	mg/L		**125**	**122**	**122**	**122**	**122**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2600**	**2590**	**2670**	**2520**	**2540**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18400**	**18500**	**18300**	**18400**	**18500**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**426**	**424**	**430**	**435**	**434**
Magnesium	7439-95-4	1	mg/L		**1370**	**1370**	**1380**	**1400**	**1400**
Sodium	7440-23-5	1	mg/L		**10600**	**10700**	**10700**	**10900**	**10900**
Potassium	7440-09-7	1	mg/L		**489**	**484**	**495**	**498**	**500**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**576**	**578**	**574**	**574**	**577**
ø Total Cations	----	0.01	meq/L		**608**	**612**	**613**	**624**	**624**
ø Ionic Balance	----	0.01	%		**2.70**	**2.81**	**3.27**	**4.16**	**3.88**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW150_220905	0089_SW152_220905	0089_QC103_220905	0089_SW154_220905	0089_SW156_220905
				Sampling date / time	05-Sep-2022 09:46	05-Sep-2022 09:58	05-Sep-2022 09:59	05-Sep-2022 10:05	05-Sep-2022 10:11
Compound	CAS Number	LOR	Unit		EP2211347-001	EP2211347-002	EP2211347-003	EP2211347-004	EP2211347-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW150_220905	0089_SW152_220905	0089_QC103_220905	0089_SW154_220905	0089_SW156_220905
				Sampling date / time	05-Sep-2022 09:46	05-Sep-2022 09:58	05-Sep-2022 09:59	05-Sep-2022 10:05	05-Sep-2022 10:11
Compound	CAS Number	LOR	Unit		EP2211347-001	EP2211347-002	EP2211347-003	EP2211347-004	EP2211347-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**116**	**93.9**	**90.7**	**105**	**103**
13C8-PFOA	----	0.02	%		**103**	**103**	**99.5**	**101**	**106**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_220905	0089_PW331_220905	0089_QC106_220905	0089_PW357_220905	0089_PW330_220905
				Sampling date / time	05-Sep-2022 10:32	05-Sep-2022 10:46	05-Sep-2022 10:46	05-Sep-2022 10:58	05-Sep-2022 11:11
Compound	CAS Number	LOR	Unit		EP2211347-006	EP2211347-007	EP2211347-008	EP2211347-009	EP2211347-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		144	203	209	151	154
Total Alkalinity as CaCO3	----	1	mg/L		144	203	209	151	154
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2640	2490	2450	2580	2640
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18200	18000	22300	18600	19000
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		435	451	441	437	449
Magnesium	7439-95-4	1	mg/L		1390	1410	1390	1400	1450
Sodium	7440-23-5	1	mg/L		10800	11000	10800	10800	11200
Potassium	7440-09-7	1	mg/L		519	551	573	503	513
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		571	564	684	581	594
ø Total Cations	----	0.01	meq/L		619	631	621	620	642
ø Ionic Balance	----	0.01	%		4.02	5.65	4.86	3.18	3.88
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_220905	0089_PW331_220905	0089_QC106_220905	0089_PW357_220905	0089_PW330_220905
				Sampling date / time	05-Sep-2022 10:32	05-Sep-2022 10:46	05-Sep-2022 10:46	05-Sep-2022 10:58	05-Sep-2022 11:11
Compound	CAS Number	LOR	Unit		EP2211347-006	EP2211347-007	EP2211347-008	EP2211347-009	EP2211347-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW356_220905	0089_PW331_220905	0089_QC106_220905	0089_PW357_220905	0089_PW330_220905
				Sampling date / time	05-Sep-2022 10:32	05-Sep-2022 10:46	05-Sep-2022 10:46	05-Sep-2022 10:58	05-Sep-2022 11:11
Compound	CAS Number	LOR	Unit		EP2211347-006	EP2211347-007	EP2211347-008	EP2211347-009	EP2211347-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.1**	**97.0**	**97.8**	**98.0**	**99.3**
13C8-PFOA	----	0.02	%		**97.3**	**96.6**	**102**	**97.2**	**98.3**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_220905	----	----	----	----
				Sampling date / time	05-Sep-2022 11:20	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211347-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**548**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**548**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2320**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18500**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**535**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1430**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**10900**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**562**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**581**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**633**	----	----	----	----
ø Ionic Balance	----	0.01	%		**4.26**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_220905	----	----	----	----
				Sampling date / time	05-Sep-2022 11:20	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211347-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_220905	----	----	----	----
				Sampling date / time	05-Sep-2022 11:20	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211347-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.3**	----	----	----	----
13C8-PFOA	----	0.02	%		**99.6**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW329_220905	----	----	----	----
				Sampling date / time	05-Sep-2022 11:28	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211347-012	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		175	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		175	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2570	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19200	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		442	----	----	----	----
Magnesium	7439-95-4	1	mg/L		1420	----	----	----	----
Sodium	7440-23-5	1	mg/L		11000	----	----	----	----
Potassium	7440-09-7	1	mg/L		507	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		599	----	----	----	----
ø Total Cations	----	0.01	meq/L		630	----	----	----	----
ø Ionic Balance	----	0.01	%		2.58	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW329_220905	----	----	----	----
				Sampling date / time	05-Sep-2022 11:28	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211347-012	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_PW329_220905	----	----	----	----
				Sampling date / time	05-Sep-2022 11:28	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211347-012	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.8**	----	----	----	----
13C8-PFOA	----	0.02	%		**96.2**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211347**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 08-Sep-2022
C-O-C number	: 41999	Issue Date	: 19-Sep-2022
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4585147)									
EP2211343-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	475	472	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	475	472	0.7	0% - 20%
EP2211343-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	303	299	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	303	299	1.3	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4585148)									
EP2211347-006	0089_PW356_220905	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	144	142	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	144	142	1.3	0% - 20%
EP2211501-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	168	161	4.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	168	161	4.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4566531)									
EP2211345-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1840	1830	0.5	0% - 20%
EP2211347-003	0089_QC103_220905	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2670	2600	2.7	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4566530)									
EP2211345-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	15000	14700	2.0	0% - 20%
EP2211347-003	0089_QC103_220905	ED045G: Chloride	16887-00-6	1	mg/L	18300	21400	15.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4566417)									
EP2211345-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	450	448	0.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1110	1120	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	8340	8410	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	433	440	1.5	0% - 20%
EP2211347-003	0089_QC103_220905	ED093F: Calcium	7440-70-2	1	mg/L	430	438	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1400	1.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10700	10900	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	495	502	1.5	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4586333)									
EP2211347-005	0089_SW156_220905	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4586333)									
EP2211347-005	0089_SW156_220905	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4586333)									
EP2211347-005	0089_SW156_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4586333) - continued									
EP2211347-005	0089_SW156_220905	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4586333)									
EP2211347-005	0089_SW156_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4586333)									
EP2211347-005	0089_SW156_220905	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4585147)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	98.1	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4585148)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	87.8	118
				<1	200 mg/L	98.8	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566531)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	93.8	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4566530)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.0	88.6	113
				<1	1000 mg/L	98.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4566417)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	109	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	111	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4586333)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	125	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	75.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	116	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	116	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4586333)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4586333) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	127	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	99.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	117	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	130	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	123	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	125	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586333)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	126	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	120	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	113	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	109	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	124	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	132	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	125	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586333)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	114	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	91.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	135	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	134	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4566531)							
EP2211345-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4566530)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 4566530) - continued							
EP2211345-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4586333)							
EP2211347-008	0089_QC106_220905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	121	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	127	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	128	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	127	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	126	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	133	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4586333)							
EP2211347-008	0089_QC106_220905	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	102	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	123	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	124	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	116	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	121	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	124	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	123	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	122	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586333)							
EP2211347-008	0089_QC106_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	117	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	135	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	119	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	116	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	124	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	117	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	111	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586333)							
EP2211347-008	0089_QC106_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	126	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	80.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	116	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586333) - continued							
EP2211347-008	0089_QC106_220905	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	96.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211347**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SW/PW - MB	Issue Date	: 19-Sep-2022
Sampler	: [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211345--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2211345--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	16	6.25	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)		***Sample Date***	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW150_220905,	0089_SW152_220905,	**05-Sep-2022**	**----**	----	----	**16-Sep-2022**	19-Sep-2022	✓
0089_QC103_220905,	0089_SW154_220905,							
0089_SW156_220905,	0089_PW356_220905,							
0089_PW331_220905,	0089_QC106_220905,							
0089_PW357_220905,	0089_PW330_220905,							
0089_PW358_220905,	0089_PW329_220905							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW150_220905,	0089_SW152_220905,	**05-Sep-2022**	**----**	----	----	**14-Sep-2022**	03-Oct-2022	✓
0089_QC103_220905,	0089_SW154_220905,							
0089_SW156_220905,	0089_PW356_220905,							
0089_PW331_220905,	0089_QC106_220905,							
0089_PW357_220905,	0089_PW330_220905,							
0089_PW358_220905,	0089_PW329_220905							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW150_220905,	0089_SW152_220905,	**05-Sep-2022**	**----**	----	----	**14-Sep-2022**	03-Oct-2022	✓
0089_QC103_220905,	0089_SW154_220905,							
0089_SW156_220905,	0089_PW356_220905,							
0089_PW331_220905,	0089_QC106_220905,							
0089_PW357_220905,	0089_PW330_220905,							
0089_PW358_220905,	0089_PW329_220905							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW150_220905,	0089_SW152_220905,	**05-Sep-2022**	**----**	----	----	**08-Sep-2022**	12-Sep-2022	✓
0089_QC103_220905,	0089_SW154_220905,							
0089_SW156_220905,	0089_PW356_220905,							
0089_PW331_220905,	0089_QC106_220905,							
0089_PW357_220905,	0089_PW330_220905,							
0089_PW358_220905,	0089_PW329_220905							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW150_220905,	0089_SW152_220905,	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
0089_QC103_220905,	0089_SW154_220905,							
0089_SW156_220905,	0089_PW356_220905,							
0089_PW331_220905,	0089_QC106_220905,							
0089_PW357_220905,	0089_PW330_220905,							
0089_PW358_220905,	0089_PW329_220905							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW150_220905,	0089_SW152_220905,	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
0089_QC103_220905,	0089_SW154_220905,							
0089_SW156_220905,	0089_PW356_220905,							
0089_PW331_220905,	0089_QC106_220905,							
0089_PW357_220905,	0089_PW330_220905,							
0089_PW358_220905,	0089_PW329_220905							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW150_220905, 0089_SW152_220905, 0089_QC103_220905, 0089_SW154_220905, 0089_SW156_220905, 0089_PW356_220905, 0089_PW331_220905, 0089_QC106_220905, 0089_PW357_220905, 0089_PW330_220905, 0089_PW358_220905, 0089_PW329_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW150_220905, 0089_SW152_220905, 0089_QC103_220905, 0089_SW154_220905, 0089_SW156_220905, 0089_PW356_220905, 0089_PW331_220905, 0089_QC106_220905, 0089_PW357_220905, 0089_PW330_220905, 0089_PW358_220905, 0089_PW329_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW150_220905, 0089_SW152_220905, 0089_QC103_220905, 0089_SW154_220905, 0089_SW156_220905, 0089_PW356_220905, 0089_PW331_220905, 0089_QC106_220905, 0089_PW357_220905, 0089_PW330_220905, 0089_PW358_220905, 0089_PW329_220905	**05-Sep-2022**	**17-Sep-2022**	04-Mar-2023	✓	**17-Sep-2022**	04-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 42005 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD356		05/09/2022 10:33 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD331		05/09/2022 10:45 AM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD357		05/09/2022 10:59 AM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_QC107		05/09/2022 10:59 AM	Soil	ALS: 1 Non ALS: 0	No	X		
005	0089_SD330		05/09/2022 11:10 AM	Soil	ALS: 1 Non ALS: 0	No	X		
006	0089_SD358		05/09/2022 11:20 AM	Soil	ALS: 1 Non ALS: 0	No	X		
007	0089_SD329		05/09/2022 11:27 AM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **42005** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD356	HDPE Soil Jar	200 mL	00620322012206	Grey	No	
002	0089_SD331	HDPE Soil Jar	200 mL	00620322012207	Grey	No	
003	0089_SD357	HDPE Soil Jar	200 mL	00620322012285	Grey	No	
004	0089_QC107	HDPE Soil Jar	200 mL	00620322012238	Grey	No	
005	0089_SD330	HDPE Soil Jar	200 mL	00620322012176	Grey	No	
006	0089_SD358	HDPE Soil Jar	200 mL	00620322012194	Grey	No	
007	0089_SD329	HDPE Soil Jar	200 mL	00620322012226	Grey	No	

Total Bottle Count: ALS: 7, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211348**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42005	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 10:30	Issue Date	: 07-Sep-2022
Client Requested Due Date	: 16-Sep-2022	Scheduled Reporting Date	: **16-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2211348-001	05-Sep-2022 10:33	0089_SD356_220905	✓	✓
EP2211348-002	05-Sep-2022 10:45	0089_SD331_220905	✓	✓
EP2211348-003	05-Sep-2022 10:59	0089_SD357_220905	✓	✓
EP2211348-004	05-Sep-2022 10:59	0089_QC107_220905	✓	✓
EP2211348-005	05-Sep-2022 11:10	0089_SD330_220905	✓	✓
EP2211348-006	05-Sep-2022 11:20	0089_SD358_220905	✓	✓
EP2211348-007	05-Sep-2022 11:27	0089_SD329_220905	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted]
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211348**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 10:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Sep-2022
C-O-C number	: 42005	Issue Date	: 16-Sep-2022 16:47
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD356_220905	0089_SD331_220905	0089_SD357_220905	0089_QC107_220905	0089_SD330_220905
				Sampling date / time	05-Sep-2022 10:33	05-Sep-2022 10:45	05-Sep-2022 10:59	05-Sep-2022 10:59	05-Sep-2022 11:10
					EP2211348-001	EP2211348-002	EP2211348-003	EP2211348-004	EP2211348-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**30.6**	**37.8**	**30.7**	**21.4**	**28.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_220905	0089_SD331_220905	0089_SD357_220905	0089_QC107_220905	0089_SD330_220905
				Sampling date / time	05-Sep-2022 10:33	05-Sep-2022 10:45	05-Sep-2022 10:59	05-Sep-2022 10:59	05-Sep-2022 11:10
Compound	CAS Number	LOR	Unit		EP2211348-001	EP2211348-002	EP2211348-003	EP2211348-004	EP2211348-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**88.5**	**112**	**92.0**	**114**	**93.0**
13C8-PFOA	----	0.0002	%		**102**	**96.5**	**108**	**97.5**	**98.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD358_220905	0089_SD329_220905	----	----	----
			Sampling date / time	05-Sep-2022 11:20	05-Sep-2022 11:27	----	----	----
Compound	CAS Number	LOR	Unit	EP2211348-006	EP2211348-007	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**31.7**	**34.1**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD358_220905	0089_SD329_220905	----	----	----
				Sampling date / time	05-Sep-2022 11:20	05-Sep-2022 11:27	----	----	----
Compound	CAS Number	LOR	Unit		EP2211348-006	EP2211348-007	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.5**	**114**	----	----	----
13C8-PFOA	----	0.0002	%		**97.0**	**100**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211348**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Sep-2022
C-O-C number	: 42005	Issue Date	: 16-Sep-2022
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4580164)									
EP2211342-003	Anonymous	EA055: Moisture Content	----	0.1	%	29.8	28.6	4.1	0% - 20%
EP2211346-009	Anonymous	EA055: Moisture Content	----	0.1	%	32.7	34.5	5.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4580165)									
EP2211457-008	Anonymous	EA055: Moisture Content	----	0.1	%	2.3	2.8	19.4	0% - 20%
ES2232732-008	Anonymous	EA055: Moisture Content	----	0.1	%	0.4	<0.1	121	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4579871)									
EP2211346-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2211348-005	0089_SD330_220905	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4579871)									
EP2211346-004	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4579871) - continued									
EP2211346-004	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2211348-005	0089_SD330_220905	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4579871)									
EP2211346-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211348-005	0089_SD330_220905	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4579871) - continued									
EP2211348-005	0089_SD330_220905	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4579871)									
EP2211346-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211348-005	0089_SD330_220905	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4579871)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	123	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4579871)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	104	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	127	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4579871)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	127	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	120	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4579871)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	122	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	114	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.6	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4579871) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.4	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4579871)							
EP2211346-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	107	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	101	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	104	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	107	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	88.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4579871)							
EP2211346-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	123	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	107	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	111	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	123	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	128	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	114	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	103	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	114	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	111	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	98.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4579871)							
EP2211346-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	121	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	126	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	122	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	110	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	117	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	105	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4579871) - continued							
EP2211346-004	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	119	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4579871)							
EP2211346-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	104	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	140	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	113	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	126	69.2	143

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211348**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SD - MB	Issue Date	: 16-Sep-2022
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD356_220905, 0089_SD331_220905, 0089_SD357_220905, 0089_QC107_220905, 0089_SD330_220905, 0089_SD358_220905, 0089_SD329_220905	**05-Sep-2022**	**----**	----	----	**14-Sep-2022**	19-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_220905, 0089_SD331_220905, 0089_SD357_220905, 0089_QC107_220905, 0089_SD330_220905, 0089_SD358_220905, 0089_SD329_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_220905, 0089_SD331_220905, 0089_SD357_220905, 0089_QC107_220905, 0089_SD330_220905, 0089_SD358_220905, 0089_SD329_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD356_220905, 0089_SD331_220905, 0089_SD357_220905, 0089_QC107_220905, 0089_SD330_220905, 0089_SD358_220905, 0089_SD329_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD356_220905, 0089_SD331_220905, 0089_SD357_220905, 0089_QC107_220905, 0089_SD330_220905, 0089_SD358_220905, 0089_SD329_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD356_220905, 0089_SD331_220905, 0089_SD357_220905, 0089_QC107_220905, 0089_SD330_220905, 0089_SD358_220905, 0089_SD329_220905	**05-Sep-2022**	**14-Sep-2022**	04-Mar-2023	✓	**15-Sep-2022**	24-Oct-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: **42036** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW496		06/09/2022 09:09 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
002	0089_MW516		06/09/2022 09:24 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0089_MW249		06/09/2022 09:31 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
004	0089_MW242		06/09/2022 09:45 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_MW245		06/09/2022 10:12 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
006	0089_MW243		06/09/2022 10:27 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
007	0089_MW239		06/09/2022 10:49 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0089_MW238		06/09/2022 11:06 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
009	0089_MW240		06/09/2022 11:19 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

ALS COC#: **42036** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_MW196		06/09/2022 12:37 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
011	0089_MW259		06/09/2022 01:00 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
012	0089_MW256		06/09/2022 01:15 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
013	0089_MW255		06/09/2022 01:27 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
014	0089_MW257		06/09/2022 01:37 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
015	0089_MW258		06/09/2022 01:50 PM	Water	ALS: 3 Non ALS: 0	No	Partial 3/8			
016	0089_QC301		06/09/2022 02:02 PM	Water	ALS: 2 Non ALS: 0	No		X		
017	0089_QC302		06/09/2022 02:04 PM	Water	ALS: 2 Non ALS: 0	No		X		
018	0089_QC303		06/09/2022 02:05 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: **42036** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0089_QC401		06/09/2022 02:06 PM	Water	ALS: 2 Non ALS: 0	No		X		
020	0089_QC402		06/09/2022 02:06 PM	Water	ALS: 2 Non ALS: 0	No		X		
021	0089_QC403		06/09/2022 02:07 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 42036 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW496	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW516	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW249	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW242	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW245	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW243	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW239	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_MW238	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_MW240	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 42036 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES TO [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_MW196	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_MW259	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_MW256	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_MW255	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_MW257	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_MW258	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 42036 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW496	HDPE (no PTFE)	20 mL	00350821013558	Grey	No	
001	0089_MW496	HDPE (no PTFE)	20 mL	00350821013423	Grey	No	
001	0089_MW496	HDPE (no PTFE)	20 mL	00350821012566	Grey	No	
001	0089_MW496	HDPE (no PTFE)	20 mL	00350821012645	Grey	No	
001	0089_MW496	Clear Plastic Bottle - Natural	500 mL	00070821039597	Green	No	
002	0089_MW516	Clear Plastic Bottle - Natural	500 mL	00070821039588	Green	No	
002	0089_MW516	HDPE (no PTFE)	20 mL	00350821012534	Grey	No	
002	0089_MW516	HDPE (no PTFE)	20 mL	00350821012484	Grey	No	
003	0089_MW249	HDPE (no PTFE)	20 mL	00350821012573	Grey	No	
003	0089_MW249	HDPE (no PTFE)	20 mL	00350821012711	Grey	No	
003	0089_MW249	Clear Plastic Bottle - Natural	500 mL	00070821057240	Green	No	
004	0089_MW242	HDPE (no PTFE)	20 mL	00350821012999	Grey	No	
004	0089_MW242	Clear Plastic Bottle - Natural	500 mL	00070821039557	Green	No	
004	0089_MW242	HDPE (no PTFE)	20 mL	00350821013062	Grey	No	
005	0089_MW245	HDPE (no PTFE)	20 mL	00350821012552	Grey	No	
005	0089_MW245	Clear Plastic Bottle - Natural	500 mL	00070821057261	Green	No	
005	0089_MW245	HDPE (no PTFE)	20 mL	00350821013028	Grey	No	
006	0089_MW243	Clear Plastic Bottle - Natural	500 mL	00070821039520	Green	No	
006	0089_MW243	HDPE (no PTFE)	20 mL	00350821012554	Grey	No	
006	0089_MW243	HDPE (no PTFE)	20 mL	00350821012879	Grey	No	
007	0089_MW239	Clear Plastic Bottle - Natural	500 mL	00070821039581	Green	No	
007	0089_MW239	HDPE (no PTFE)	20 mL	00350821012596	Grey	No	
007	0089_MW239	HDPE (no PTFE)	20 mL	00350821012601	Grey	No	
008	0089_MW238	HDPE (no PTFE)	20 mL	00350821012667	Grey	No	
008	0089_MW238	Clear Plastic Bottle - Natural	500 mL	00070821057269	Green	No	
008	0089_MW238	HDPE (no PTFE)	20 mL	00350821012630	Grey	No	

CHAIN OF CUSTODY

COC#: 42036 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_MW240	HDPE (no PTFE)	20 mL	00350821012516	Grey	No	
009	0089_MW240	HDPE (no PTFE)	20 mL	00350821012975	Grey	No	
009	0089_MW240	Clear Plastic Bottle - Natural	500 mL	00070821039524	Green	No	
010	0089_MW196	Clear Plastic Bottle - Natural	500 mL	00070821057201	Green	No	
010	0089_MW196	HDPE (no PTFE)	20 mL	00350821013029	Grey	No	
010	0089_MW196	HDPE (no PTFE)	20 mL	00350821012483	Grey	No	
011	0089_MW259	HDPE (no PTFE)	20 mL	00350821013452	Grey	No	
011	0089_MW259	HDPE (no PTFE)	20 mL	00350821013609	Grey	No	
011	0089_MW259	HDPE (no PTFE)	20 mL	00350821012593	Grey	No	
011	0089_MW259	HDPE (no PTFE)	20 mL	00350821012581	Grey	No	
011	0089_MW259	Clear Plastic Bottle - Natural	500 mL	00070821057248	Green	No	
012	0089_MW256	HDPE (no PTFE)	20 mL	00350821013068	Grey	No	
012	0089_MW256	HDPE (no PTFE)	20 mL	00350821012834	Grey	No	
012	0089_MW256	Clear Plastic Bottle - Natural	500 mL	00070821039539	Green	No	
013	0089_MW255	Clear Plastic Bottle - Natural	500 mL	00070821057232	Green	No	
013	0089_MW255	HDPE (no PTFE)	20 mL	00350821012930	Grey	No	
013	0089_MW255	HDPE (no PTFE)	20 mL	00350821012985	Grey	No	
014	0089_MW257	Clear Plastic Bottle - Natural	500 mL	00070821039583	Green	No	
014	0089_MW257	HDPE (no PTFE)	20 mL	00350821012888	Grey	No	
014	0089_MW257	HDPE (no PTFE)	20 mL	00350821012842	Grey	No	
015	0089_MW258	HDPE (no PTFE)	20 mL	00350821012836	Grey	No	
015	0089_MW258	HDPE (no PTFE)	20 mL	00350821012995	Grey	No	
015	0089_MW258	Clear Plastic Bottle - Natural	500 mL	00070821057210	Green	No	
016	0089_QC301	HDPE (no PTFE)	20 mL	00350821013442	Grey	No	
016	0089_QC301	HDPE (no PTFE)	20 mL	00350821013544	Grey	No	
017	0089_QC302	HDPE (no PTFE)	20 mL	00350821013026	Grey	No	
017	0089_QC302	HDPE (no PTFE)	20 mL	00350821012976	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 42036 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

018	0089_QC303	HDPE (no PTFE)	20 mL	00350821012849	Grey	No	
018	0089_QC303	HDPE (no PTFE)	20 mL	00350821012835	Grey	No	
019	0089_QC401	HDPE (no PTFE)	20 mL	00350821012920	Grey	No	
019	0089_QC401	HDPE (no PTFE)	20 mL	00350821013525	Grey	No	
020	0089_QC402	HDPE (no PTFE)	20 mL	00350821012871	Grey	No	
020	0089_QC402	HDPE (no PTFE)	20 mL	00350821013469	Grey	No	
021	0089_QC403	HDPE (no PTFE)	20 mL	00350821012809	Grey	No	
021	0089_QC403	HDPE (no PTFE)	20 mL	00350821012803	Grey	No	

Total Bottle Count: ALS: 61, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211389**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42036	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 16:00	Issue Date	: 13-Sep-2022
Client Requested Due Date	: 21-Sep-2022	Scheduled Reporting Date	: **21-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 21 / 21

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211389-001	06-Sep-2022 09:09	0089_MW496_220906	✓	✓	✓	✓
EP2211389-002	06-Sep-2022 09:24	0089_MW516_220906	✓	✓	✓	✓
EP2211389-003	06-Sep-2022 09:31	0089_MW249_220906	✓	✓	✓	✓
EP2211389-004	06-Sep-2022 09:45	0089_MW242_220906	✓	✓	✓	✓
EP2211389-005	06-Sep-2022 10:12	0089_MW245_220906	✓	✓	✓	✓
EP2211389-006	06-Sep-2022 10:27	0089_MW243_220906	✓	✓	✓	✓
EP2211389-007	06-Sep-2022 10:49	0089_MW239_220906	✓	✓	✓	✓
EP2211389-008	06-Sep-2022 11:06	0089_MW238_220906	✓	✓	✓	✓
EP2211389-009	06-Sep-2022 11:19	0089_MW240_220906	✓	✓	✓	✓
EP2211389-010	06-Sep-2022 12:37	0089_MW196_220906	✓	✓	✓	✓
EP2211389-011	06-Sep-2022 13:00	0089_MW259_220906	✓	✓	✓	✓
EP2211389-012	06-Sep-2022 13:15	0089_MW256_220906	✓	✓	✓	✓
EP2211389-013	06-Sep-2022 13:27	0089_MW255_220906	✓	✓	✓	✓
EP2211389-014	06-Sep-2022 13:37	0089_MW257_220906	✓	✓	✓	✓
EP2211389-015	06-Sep-2022 13:50	0089_MW258_220906		✓	✓	✓
EP2211389-016	06-Sep-2022 14:02	0089_QC301_220906		✓		
EP2211389-017	06-Sep-2022 14:04	0089_QC302_220906		✓		
EP2211389-018	06-Sep-2022 14:05	0089_QC303_220906		✓		
EP2211389-019	06-Sep-2022 14:06	0089_QC401_220906		✓		
EP2211389-020	06-Sep-2022 14:06	0089_QC402_220906		✓		
EP2211389-021	06-Sep-2022 14:07	0089_QC403_220906		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]stantec.com
DERP LAB REPORTS		
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
[redacted] **(STANTEC)**		
- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]stantec.com
- Chain of Custody (CoC) (COC)	Email	[redacted]stantec.com
- EDI Format - ESDAT (ESDAT)	Email	[redacted]stantec.com
- EDI Format - XTab (XTAB)	Email	[redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211389**	Page	: 1 of 16
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 16:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42036	Issue Date	: 21-Sep-2022 14:36
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 21		
No. of samples analysed	: 21		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW496_220906	0089_MW516_220906	0089_MW249_220906	0089_MW242_220906	0089_MW245_220906
				Sampling date / time	06-Sep-2022 09:09	06-Sep-2022 09:24	06-Sep-2022 09:31	06-Sep-2022 09:45	06-Sep-2022 10:12
					EP2211389-001	EP2211389-002	EP2211389-003	EP2211389-004	EP2211389-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**428**	**501**	**444**	**206**	**304**
Total Alkalinity as CaCO3	----	1	mg/L		**428**	**501**	**444**	**206**	**304**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**109**	**164**	**71**	**44**	**8**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**221**	**284**	**139**	**39**	**21**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**88**	**138**	**120**	**76**	**105**
Magnesium	7439-95-4	1	mg/L		**57**	**71**	**42**	**17**	**12**
Sodium	7440-23-5	1	mg/L		**146**	**172**	**88**	**32**	**16**
Potassium	7440-09-7	1	mg/L		**13**	**22**	**2**	**3**	**2**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**17.0**	**21.4**	**14.3**	**6.13**	**6.83**
ø Total Cations	----	0.01	meq/L		**15.8**	**20.8**	**13.3**	**6.66**	**6.97**
ø Ionic Balance	----	0.01	%		**3.93**	**1.57**	**3.43**	**4.13**	**1.02**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.07**	**0.25**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.13**	**0.29**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.85**	**1.89**	**0.15**	<0.01	**0.02**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.18**	**0.14**	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**6.95**	**4.32**	**0.08**	**0.01**	**0.06**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.22**	**0.23**	**0.02**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.05**	**0.03**	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW496_220906	0089_MW516_220906	0089_MW249_220906	0089_MW242_220906	0089_MW245_220906
				Sampling date / time	06-Sep-2022 09:09	06-Sep-2022 09:24	06-Sep-2022 09:31	06-Sep-2022 09:45	06-Sep-2022 10:12
Compound	CAS Number	LOR	Unit		EP2211389-001	EP2211389-002	EP2211389-003	EP2211389-004	EP2211389-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.16**	**0.16**	**0.01**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW496_220906	0089_MW516_220906	0089_MW249_220906	0089_MW242_220906	0089_MW245_220906
				Sampling date / time	06-Sep-2022 09:09	06-Sep-2022 09:24	06-Sep-2022 09:31	06-Sep-2022 09:45	06-Sep-2022 10:12
					EP2211389-001	EP2211389-002	EP2211389-003	EP2211389-004	EP2211389-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**9.61**	**7.31**	**0.26**	**0.01**	**0.08**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**8.80**	**6.21**	**0.23**	**0.01**	**0.08**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**9.30**	**6.88**	**0.26**	**0.01**	**0.08**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**116**	**91.0**	**94.0**	**93.2**	**91.3**
13C8-PFOA	----	0.02	%		**102**	**100**	**98.7**	**96.7**	**97.8**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW243_220906	0089_MW239_220906	0089_MW238_220906	0089_MW240_220906	0089_MW196_220906
				Sampling date / time	06-Sep-2022 10:27	06-Sep-2022 10:49	06-Sep-2022 11:06	06-Sep-2022 11:19	06-Sep-2022 12:37
					EP2211389-006	EP2211389-007	EP2211389-008	EP2211389-009	EP2211389-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**264**	**202**	**205**	**255**	**229**
Total Alkalinity as CaCO3	----	1	mg/L		**264**	**202**	**205**	**255**	**229**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**54**	**28**	**33**	**39**	**23**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**70**	**36**	**31**	**40**	**31**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**116**	**81**	**78**	**112**	**66**
Magnesium	7439-95-4	1	mg/L		**17**	**11**	**13**	**12**	**19**
Sodium	7440-23-5	1	mg/L		**39**	**22**	**24**	**31**	**23**
Potassium	7440-09-7	1	mg/L		**5**	**2**	**3**	**3**	**2**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**8.37**	**5.63**	**5.66**	**7.04**	**5.93**
ø Total Cations	----	0.01	meq/L		**9.01**	**5.96**	**6.08**	**8.00**	**5.91**
ø Ionic Balance	----	0.01	%		**3.67**	**2.77**	**3.62**	**6.43**	**0.17**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.06**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.11**	**0.05**	<0.01	**3.80**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.16**	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.16**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.04**	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_220906	0089_MW239_220906	0089_MW238_220906	0089_MW240_220906	0089_MW196_220906
				Sampling date / time	06-Sep-2022 10:27	06-Sep-2022 10:49	06-Sep-2022 11:06	06-Sep-2022 11:19	06-Sep-2022 12:37
Compound	CAS Number	LOR	Unit		EP2211389-006	EP2211389-007	EP2211389-008	EP2211389-009	EP2211389-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.11**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_220906	0089_MW239_220906	0089_MW238_220906	0089_MW240_220906	0089_MW196_220906
				Sampling date / time	06-Sep-2022 10:27	06-Sep-2022 10:49	06-Sep-2022 11:06	06-Sep-2022 11:19	06-Sep-2022 12:37
Compound	CAS Number	LOR	Unit		EP2211389-006	EP2211389-007	EP2211389-008	EP2211389-009	EP2211389-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.27**	**0.05**	<0.01	**4.17**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.27**	**0.05**	<0.01	**3.80**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.27**	**0.05**	<0.01	**4.11**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.6**	**89.0**	**92.1**	**89.0**	**92.5**
13C8-PFOA	----	0.02	%		**96.0**	**98.2**	**96.1**	**98.0**	**99.2**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW259_220906	0089_MW256_220906	0089_MW255_220906	0089_MW257_220906	0089_MW258_220906
				Sampling date / time	06-Sep-2022 13:00	06-Sep-2022 13:15	06-Sep-2022 13:27	06-Sep-2022 13:37	06-Sep-2022 13:50
					EP2211389-011	EP2211389-012	EP2211389-013	EP2211389-014	EP2211389-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**200**	**430**	**298**	**115**	**335**
Total Alkalinity as CaCO3	----	1	mg/L		**200**	**430**	**298**	**115**	**335**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**6**	**46**	**35**	**6**	**76**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**24**	**372**	**75**	**27**	**120**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**62**	**156**	**91**	**40**	**128**
Magnesium	7439-95-4	1	mg/L		**8**	**33**	**22**	**4**	**27**
Sodium	7440-23-5	1	mg/L		**16**	**165**	**54**	**13**	**66**
Potassium	7440-09-7	1	mg/L		<1	**8**	**3**	**2**	**13**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**4.80**	**20.0**	**8.80**	**3.18**	**----**
ø Total Cations	----	0.01	meq/L		**4.45**	**17.9**	**8.78**	**2.94**	**----**
ø Ionic Balance	----	0.01	%		**3.78**	**5.70**	**0.12**	**3.96**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.03**	**0.93**	**0.13**	<0.02	**6.69**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.08**	**0.41**	**0.33**	<0.02	**5.32**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.22**	**3.32**	**0.94**	**0.16**	**15.7**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.15**	<0.02	<0.02	**0.42**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.18**	**9.10**	**0.95**	**0.20**	**9.12**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.6**	<0.1	<0.1	**1.5**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.13**	**0.59**	**0.09**	**0.04**	**2.99**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.17**	**1.19**	**0.52**	**0.05**	**9.00**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.11**	**0.19**	<0.02	**0.83**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW259_220906	0089_MW256_220906	0089_MW255_220906	0089_MW257_220906	0089_MW258_220906
				Sampling date / time	06-Sep-2022 13:00	06-Sep-2022 13:15	06-Sep-2022 13:27	06-Sep-2022 13:37	06-Sep-2022 13:50
Compound	CAS Number	LOR	Unit		EP2211389-011	EP2211389-012	EP2211389-013	EP2211389-014	EP2211389-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.19**	**0.03**	**0.02**	**0.58**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	**0.07**	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**0.18**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW259_220906	0089_MW256_220906	0089_MW255_220906	0089_MW257_220906	0089_MW258_220906
				Sampling date / time	06-Sep-2022 13:00	06-Sep-2022 13:15	06-Sep-2022 13:27	06-Sep-2022 13:37	06-Sep-2022 13:50
Compound	CAS Number	LOR	Unit		EP2211389-011	EP2211389-012	EP2211389-013	EP2211389-014	EP2211389-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.81**	**16.7**	**3.18**	**0.47**	**52.3**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.40**	**12.4**	**1.89**	**0.36**	**24.8**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.73**	**16.0**	**2.85**	**0.47**	**46.6**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.9**	**100**	**96.8**	**88.1**	**91.9**
13C8-PFOA	----	0.02	%		**99.8**	**102**	**94.9**	**101**	**97.3**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC301_220906	0089_QC302_220906	0089_QC303_220906	0089_QC401_220906	0089_QC402_220906
				Sampling date / time	06-Sep-2022 14:02	06-Sep-2022 14:04	06-Sep-2022 14:05	06-Sep-2022 14:06	06-Sep-2022 14:06
					EP2211389-016	EP2211389-017	EP2211389-018	EP2211389-019	EP2211389-020
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220906	0089_QC302_220906	0089_QC303_220906	0089_QC401_220906	0089_QC402_220906
				Sampling date / time	06-Sep-2022 14:02	06-Sep-2022 14:04	06-Sep-2022 14:05	06-Sep-2022 14:06	06-Sep-2022 14:06
Compound	CAS Number	LOR	Unit		EP2211389-016	EP2211389-017	EP2211389-018	EP2211389-019	EP2211389-020
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.6**	**94.6**	**99.4**	**89.7**	**97.5**
13C8-PFOA	----	0.02	%		**99.3**	**94.0**	**99.5**	**97.2**	**97.1**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	**0089_QC403_220906**	----	----	----	----
				Sampling date / time	06-Sep-2022 14:07	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2211389-021**	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	**0089_QC403_220906**	----	----	----	----
				Sampling date / time	06-Sep-2022 14:07	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EP2211389-021**	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.2**	----	----	----	----
13C8-PFOA	----	0.02	%		**96.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211389**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42036	Issue Date	: 21-Sep-2022
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 21		
No. of samples analysed	: 21		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4586678)									
EP2211389-002	0089_MW516_220906	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	501	498	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	501	498	0.7	0% - 20%
EP2211389-012	0089_MW256_220906	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	430	422	1.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	430	422	1.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4571789)									
EP2211389-001	0089_MW496_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	109	110	0.0	0% - 20%
EP2211389-011	0089_MW259_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	6	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4571788)									
EP2211389-001	0089_MW496_220906	ED045G: Chloride	16887-00-6	1	mg/L	221	211	4.9	0% - 20%
EP2211389-011	0089_MW259_220906	ED045G: Chloride	16887-00-6	1	mg/L	24	24	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4572110)									
EP2211389-001	0089_MW496_220906	ED093F: Calcium	7440-70-2	1	mg/L	88	88	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	57	57	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	146	147	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP2211389-011	0089_MW259_220906	ED093F: Calcium	7440-70-2	1	mg/L	62	64	2.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	8	9	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4588981)									
EP2211389-001	0089_MW496_220906	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.85	1.85	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	6.95	6.92	0.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.07	0.08	16.5	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.13	0.12	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.18	0.16	11.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4588981)									
EP2211389-001	0089_MW496_220906	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.16	0.17	0.0	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.22	0.23	0.0	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4588981)									
EP2211389-001	0089_MW496_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4588981)									
EP2211389-001	0089_MW496_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4588981) - continued									
EP2211389-001	0089_MW496_220906	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4588981)									
EP2211389-001	0089_MW496_220906	EP231X: Sum of PFAS	----	0.01	µg/L	9.61	9.58	0.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4586678)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	87.8	118
				<1	200 mg/L	96.5	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4571789)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.9	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4571788)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	90.8	88.6	113
				<1	1000 mg/L	97.3	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4572110)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	110	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588981)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	82.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	93.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	91.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	89.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	79.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588996)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	91.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	87.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	91.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	93.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	88.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588981)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588981) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	93.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	85.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588996)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	97.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588981)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	91.8	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588996)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	92.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	66.0	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588996) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	100	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588981)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	94.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	87.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	97.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	74.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588996)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	86.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	94.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	98.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	81.6	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4571789)							
EP2211389-001	0089_MW496_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	115	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4571788)							
EP2211389-001	0089_MW496_220906	ED045G: Chloride	16887-00-6	1000 mg/L	89.0	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588981)							
EP2211389-011	0089_MW259_220906	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	82.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	99.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	99.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	83.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	88.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	82.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588981)							
EP2211389-011	0089_MW259_220906	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	91.8	73.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588981) - continued							
EP2211389-011	0089_MW259_220906	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	92.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	90.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	92.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	102	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	111	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	99.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	118	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588981)							
EP2211389-011	0089_MW259_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	90.2	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	96.1	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	107	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	93.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	89.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588981)							
EP2211389-011	0089_MW259_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	95.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	94.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	121	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211389**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling GW - MB	Issue Date	: 21-Sep-2022
Sampler	: [redacted]	No. of samples received	: 21
Order number	: pfas-omp/Stirling	No. of samples analysed	: 21

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	28	3.57	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	28	3.57	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW496_220906, 0089_MW516_220906, 0089_MW249_220906, 0089_MW242_220906, 0089_MW245_220906, 0089_MW243_220906, 0089_MW239_220906, 0089_MW238_220906, 0089_MW240_220906, 0089_MW196_220906, 0089_MW259_220906, 0089_MW256_220906, 0089_MW255_220906, 0089_MW257_220906, 0089_MW258_220906	**06-Sep-2022**	**----**	----	----	**17-Sep-2022**	20-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW496_220906, 0089_MW516_220906, 0089_MW249_220906, 0089_MW242_220906, 0089_MW245_220906, 0089_MW243_220906, 0089_MW239_220906, 0089_MW238_220906, 0089_MW240_220906, 0089_MW196_220906, 0089_MW259_220906, 0089_MW256_220906, 0089_MW255_220906, 0089_MW257_220906, 0089_MW258_220906	**06-Sep-2022**	**----**	----	----	**14-Sep-2022**	04-Oct-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW496_220906, 0089_MW516_220906, 0089_MW249_220906, 0089_MW242_220906, 0089_MW245_220906, 0089_MW243_220906, 0089_MW239_220906, 0089_MW238_220906, 0089_MW240_220906, 0089_MW196_220906, 0089_MW259_220906, 0089_MW256_220906, 0089_MW255_220906, 0089_MW257_220906, 0089_MW258_220906	**06-Sep-2022**	**----**	----	----	**14-Sep-2022**	04-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW496_220906, 0089_MW516_220906, 0089_MW249_220906, 0089_MW242_220906, 0089_MW245_220906, 0089_MW243_220906, 0089_MW239_220906, 0089_MW238_220906, 0089_MW240_220906, 0089_MW196_220906, 0089_MW259_220906, 0089_MW256_220906, 0089_MW255_220906, 0089_MW257_220906, 0089_MW258_220906	**06-Sep-2022**	**----**	----	----	**12-Sep-2022**	13-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC402_220906, 0089_QC403_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW496_220906, 0089_MW516_220906, 0089_MW249_220906, 0089_MW242_220906, 0089_MW245_220906, 0089_MW243_220906, 0089_MW239_220906, 0089_MW238_220906, 0089_MW240_220906, 0089_MW196_220906, 0089_MW259_220906, 0089_MW256_220906, 0089_MW255_220906, 0089_MW257_220906, 0089_MW258_220906, 0089_QC301_220906, 0089_QC302_220906, 0089_QC303_220906, 0089_QC401_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC402_220906, 0089_QC403_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW496_220906, 0089_MW516_220906, 0089_MW249_220906, 0089_MW242_220906, 0089_MW245_220906, 0089_MW243_220906, 0089_MW239_220906, 0089_MW238_220906, 0089_MW240_220906, 0089_MW196_220906, 0089_MW259_220906, 0089_MW256_220906, 0089_MW255_220906, 0089_MW257_220906, 0089_MW258_220906, 0089_QC301_220906, 0089_QC302_220906, 0089_QC303_220906, 0089_QC401_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_QC402_220906, 0089_QC403_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW496_220906, 0089_MW516_220906, 0089_MW249_220906, 0089_MW242_220906, 0089_MW245_220906, 0089_MW243_220906, 0089_MW239_220906, 0089_MW238_220906, 0089_MW240_220906, 0089_MW196_220906, 0089_MW259_220906, 0089_MW256_220906, 0089_MW255_220906, 0089_MW257_220906, 0089_MW258_220906, 0089_QC301_220906, 0089_QC302_220906, 0089_QC303_220906, 0089_QC401_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC402_220906, 0089_QC403_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW496_220906, 0089_MW516_220906, 0089_MW249_220906, 0089_MW242_220906, 0089_MW245_220906, 0089_MW243_220906, 0089_MW239_220906, 0089_MW238_220906, 0089_MW240_220906, 0089_MW196_220906, 0089_MW259_220906, 0089_MW256_220906, 0089_MW255_220906, 0089_MW257_220906, 0089_MW258_220906, 0089_QC301_220906, 0089_QC302_220906, 0089_QC303_220906, 0089_QC401_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_QC402_220906, 0089_QC403_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
0089_MW496_220906, 0089_MW516_220906, 0089_MW249_220906, 0089_MW242_220906, 0089_MW245_220906, 0089_MW243_220906, 0089_MW239_220906, 0089_MW238_220906, 0089_MW240_220906, 0089_MW196_220906, 0089_MW259_220906, 0089_MW256_220906, 0089_MW255_220906, 0089_MW257_220906, 0089_MW258_220906, 0089_QC301_220906, 0089_QC302_220906, 0089_QC303_220906, 0089_QC401_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	28	**3.57**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	28	**3.57**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 42057 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW288		06/09/2022 08:52 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_MW233		06/09/2022 09:48 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
003	0089_MW203		06/09/2022 10:06 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
004	0089_MW236		06/09/2022 10:20 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_MW268		06/09/2022 10:40 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
006	0089_MW269		06/09/2022 10:57 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_MW226		06/09/2022 12:49 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 42057 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW288	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW233	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW203	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW236	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_MW268	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_MW269	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_MW226	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 42057 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW288	Clear Plastic Bottle - Natural	500 mL	00070821057260	Green	No	
001	0089_MW288	HDPE (no PTFE)	20 mL	00350821012873	Grey	No	
001	0089_MW288	HDPE (no PTFE)	20 mL	00350821012535	Grey	No	
001	0089_MW288	HDPE (no PTFE)	20 mL	00350821012490	Grey	No	
001	0089_MW288	HDPE (no PTFE)	20 mL	00350821012921	Grey	No	
002	0089_MW233	HDPE (no PTFE)	20 mL	00350821012838	Grey	No	
002	0089_MW233	HDPE (no PTFE)	20 mL	00350821012957	Grey	No	
002	0089_MW233	Clear Plastic Bottle - Natural	500 mL	00070821057203	Green	No	
002	0089_MW233	HDPE (no PTFE)	20 mL	00350821013046	Grey	No	
002	0089_MW233	HDPE (no PTFE)	20 mL	00350821013060	Grey	No	
003	0089_MW203	HDPE (no PTFE)	20 mL	00350821013035	Grey	No	
003	0089_MW203	HDPE (no PTFE)	20 mL	00350821012872	Grey	No	
003	0089_MW203	HDPE (no PTFE)	20 mL	00350821013047	Grey	No	
003	0089_MW203	HDPE (no PTFE)	20 mL	00350821012542	Grey	No	
003	0089_MW203	Clear Plastic Bottle - Natural	500 mL	00070821057272	Green	No	
004	0089_MW236	HDPE (no PTFE)	20 mL	00350821012489	Grey	No	
004	0089_MW236	Clear Plastic Bottle - Natural	500 mL	00070821039519	Green	No	
004	0089_MW236	HDPE (no PTFE)	20 mL	00350821012565	Grey	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00352101057654	Grey	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00352101038282	Grey	No	
005	0089_MW268	Clear Plastic Bottle - Natural	500 mL	00070821039530	Green	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00350821013071	Grey	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00350821013074	Grey	No	
006	0089_MW269	Clear Plastic Bottle - Natural	500 mL	00070821039579	Green	No	
006	0089_MW269	HDPE (no PTFE)	20 mL	00350821012641	Grey	No	
006	0089_MW269	HDPE (no PTFE)	20 mL	00350821012544	Grey	No	

CHAIN OF CUSTODY

COC#: **42057** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

007	0089_MW226	HDPE (no PTFE)	20 mL	00350821012826	Grey	No	
007	0089_MW226	HDPE (no PTFE)	20 mL	00350821013016	Grey	No	
007	0089_MW226	Clear Plastic Bottle - Natural	500 mL	00070821039546	Green	No	
007	0089_MW226	HDPE (no PTFE)	20 mL	00350821013050	Grey	No	
007	0089_MW226	HDPE (no PTFE)	20 mL	00350821012987	Grey	No	

Total Bottle Count: ALS: 31, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211390**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42057	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 16:00	Issue Date	: 09-Sep-2022
Client Requested Due Date	: 21-Sep-2022	Scheduled Reporting Date	: **21-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211390-001	06-Sep-2022 08:52	0089_MW288_220906	✓	✓	✓	✓
EP2211390-002	06-Sep-2022 09:48	0089_MW233_220906	✓	✓	✓	✓
EP2211390-003	06-Sep-2022 10:06	0089_MW203_220906	✓	✓	✓	✓
EP2211390-004	06-Sep-2022 10:20	0089_MW236_220906	✓	✓	✓	✓
EP2211390-005	06-Sep-2022 10:40	0089_MW268_220906	✓	✓	✓	✓
EP2211390-006	06-Sep-2022 10:57	0089_MW269_220906	✓	✓	✓	✓
EP2211390-007	06-Sep-2022 12:49	0089_MW226_220906	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211390**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 16:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42057	Issue Date	: 21-Sep-2022 21:44
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_MW288_220906	0089_MW233_220906	0089_MW203_220906	0089_MW236_220906	0089_MW268_220906
				Sampling date / time	06-Sep-2022 08:52	06-Sep-2022 09:48	06-Sep-2022 10:06	06-Sep-2022 10:20	06-Sep-2022 10:40
					EP2211390-001	EP2211390-002	EP2211390-003	EP2211390-004	EP2211390-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**316**	**107**	**292**	**264**	**458**
Total Alkalinity as CaCO3	----	1	mg/L		**316**	**107**	**292**	**264**	**458**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**41**	**5**	**71**	**29**	**680**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**52**	**18**	**44**	**38**	**1340**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**92**	**34**	**75**	**89**	**190**
Magnesium	7439-95-4	1	mg/L		**22**	**4**	**39**	**17**	**208**
Sodium	7440-23-5	1	mg/L		**52**	**10**	**51**	**28**	**861**
Potassium	7440-09-7	1	mg/L		**4**	**2**	**6**	<1	**51**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**8.63**	**2.75**	**8.55**	**6.95**	**61.1**
ø Total Cations	----	0.01	meq/L		**8.76**	**2.51**	**9.32**	**7.06**	**65.4**
ø Ionic Balance	----	0.01	%		**0.76**	**4.52**	**4.31**	**0.77**	**3.36**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	**0.39**	**0.06**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	**1.17**	**0.08**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.02**	**0.01**	**0.05**	**48.1**	**0.58**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	**0.49**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**4.63**	**0.06**	<0.01	**68.9**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	**0.1**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	**0.21**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	**1.35**	**0.05**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.87**	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_220906	0089_MW233_220906	0089_MW203_220906	0089_MW236_220906	0089_MW268_220906
				Sampling date / time	06-Sep-2022 08:52	06-Sep-2022 09:48	06-Sep-2022 10:06	06-Sep-2022 10:20	06-Sep-2022 10:40
Compound	CAS Number	LOR	Unit		EP2211390-001	EP2211390-002	EP2211390-003	EP2211390-004	EP2211390-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**1.70**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	**3.35**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_220906	0089_MW233_220906	0089_MW203_220906	0089_MW236_220906	0089_MW268_220906
				Sampling date / time	06-Sep-2022 08:52	06-Sep-2022 09:48	06-Sep-2022 10:06	06-Sep-2022 10:20	06-Sep-2022 10:40
Compound	CAS Number	LOR	Unit		EP2211390-001	EP2211390-002	EP2211390-003	EP2211390-004	EP2211390-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**4.65**	**0.07**	**0.05**	**127**	**0.77**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**4.65**	**0.07**	**0.05**	**117**	**0.58**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**4.65**	**0.07**	**0.05**	**122**	**0.69**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**87.7**	**94.0**	**94.6**	**90.0**	**92.7**
13C8-PFOA	----	0.02	%		**94.4**	**95.7**	**98.6**	**93.2**	**94.6**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_220906	0089_MW226_220906	----	----	----
				Sampling date / time	06-Sep-2022 10:57	06-Sep-2022 12:49	----	----	----
Compound	CAS Number	LOR	Unit		EP2211390-006	EP2211390-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**384**	**593**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**384**	**593**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**96**	**2090**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**285**	**13700**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**68**	**393**	----	----	----
Magnesium	7439-95-4	1	mg/L		**58**	**1060**	----	----	----
Sodium	7440-23-5	1	mg/L		**180**	**7860**	----	----	----
Potassium	7440-09-7	1	mg/L		**15**	**484**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**17.7**	**442**	----	----	----
ø Total Cations	----	0.01	meq/L		**16.4**	**461**	----	----	----
ø Ionic Balance	----	0.01	%		**3.90**	**2.14**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.06**	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.09**	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.63**	**0.02**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.51**	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.03**	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.12**	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_220906	0089_MW226_220906	----	----	----
				Sampling date / time	06-Sep-2022 10:57	06-Sep-2022 12:49	----	----	----
Compound	CAS Number	LOR	Unit		EP2211390-006	EP2211390-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.02**	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW269_220906	0089_MW226_220906	----	----	----
				Sampling date / time	06-Sep-2022 10:57	06-Sep-2022 12:49	----	----	----
Compound	CAS Number	LOR	Unit		EP2211390-006	EP2211390-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**1.46**	**0.02**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.14**	**0.02**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.37**	**0.02**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.7**	**90.4**	----	----	----
13C8-PFOA	----	0.02	%		**97.1**	**95.2**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211390**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42057	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4586678)									
EP2211389-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	501	498	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	501	498	0.7	0% - 20%
EP2211389-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	430	422	1.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	430	422	1.8	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4586679)									
EP2211390-006	0089_MW269_220906	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	384	389	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	384	389	1.5	0% - 20%
EP2211391-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	131	127	2.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	131	127	2.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4572080)									
EP2211390-001	0089_MW288_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	41	40	0.0	0% - 20%
EP2211391-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2470	2470	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4572079)									
EP2211390-001	0089_MW288_220906	ED045G: Chloride	16887-00-6	1	mg/L	52	53	2.0	0% - 20%
EP2211391-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17400	17200	1.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4572110)									
EP2211389-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	88	88	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	57	57	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	146	147	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP2211389-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	62	64	2.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	8	9	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4572111)									
EP2211390-006	0089_MW269_220906	ED093F: Calcium	7440-70-2	1	mg/L	68	69	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	58	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	180	181	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%
EP2211391-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	441	449	1.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1440	2.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	11200	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	502	509	1.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4588983)									
EP2211390-001	0089_MW288_220906	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	4.63	4.62	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2211391-004	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4588983)									
EP2211390-001	0089_MW288_220906	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4588983) - continued									
EP2211390-001	0089_MW288_220906	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2211391-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4588983)									
EP2211390-001	0089_MW288_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211391-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4588983)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4588983) - continued									
EP2211390-001	0089_MW288_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211391-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4588983)									
EP2211390-001	0089_MW288_220906	EP231X: Sum of PFAS	----	0.01	µg/L	4.65	4.64	0.2	0% - 20%
EP2211391-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4586678)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	87.8	118
				<1	200 mg/L	96.5	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4586679)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	97.8	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4572080)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.7	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4572079)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.6	88.6	113
				<1	1000 mg/L	94.7	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4572110)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	110	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4572111)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	109	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588983)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	79.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	93.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	86.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	87.6	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588983) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	86.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	87.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588983)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	101	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588983)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	97.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.9	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	96.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588983)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	89.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	90.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	81.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4572080)							
EP2211390-001	0089_MW288_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	111	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4572079)							
EP2211390-001	0089_MW288_220906	ED045G: Chloride	16887-00-6	1000 mg/L	95.8	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588983)							
EP2211390-002	0089_MW233_220906	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	114	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	118	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	115	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	113	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	138	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	112	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588983)							
EP2211390-002	0089_MW233_220906	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	118	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	118	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	117	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	122	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	117	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	117	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	118	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	114	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	110	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	122	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588983)							
EP2211390-002	0089_MW233_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	126	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	121	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	112	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	125	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	117	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588983)							
EP2211390-002	0089_MW233_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	114	64.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588983) - continued							
EP2211390-002	0089_MW233_220906	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	123	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	109	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211390**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling GW - JS	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW288_220906, 0089_MW233_220906, 0089_MW203_220906, 0089_MW236_220906, 0089_MW268_220906, 0089_MW269_220906, 0089_MW226_220906	**06-Sep-2022**	**----**	----	----	**17-Sep-2022**	20-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW288_220906, 0089_MW233_220906, 0089_MW203_220906, 0089_MW236_220906, 0089_MW268_220906, 0089_MW269_220906, 0089_MW226_220906	**06-Sep-2022**	**----**	----	----	**14-Sep-2022**	04-Oct-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW288_220906, 0089_MW233_220906, 0089_MW203_220906, 0089_MW236_220906, 0089_MW268_220906, 0089_MW269_220906, 0089_MW226_220906	**06-Sep-2022**	**----**	----	----	**14-Sep-2022**	04-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW288_220906, 0089_MW233_220906, 0089_MW203_220906, 0089_MW236_220906, 0089_MW268_220906, 0089_MW269_220906, 0089_MW226_220906	**06-Sep-2022**	**----**	----	----	**12-Sep-2022**	13-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW288_220906, 0089_MW233_220906, 0089_MW203_220906, 0089_MW236_220906, 0089_MW268_220906, 0089_MW269_220906, 0089_MW226_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW288_220906, 0089_MW233_220906, 0089_MW203_220906, 0089_MW236_220906, 0089_MW268_220906, 0089_MW269_220906, 0089_MW226_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW288_220906, 0089_MW233_220906, 0089_MW203_220906, 0089_MW236_220906, 0089_MW268_220906, 0089_MW269_220906, 0089_MW226_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW288_220906, 0089_MW233_220906, 0089_MW203_220906, 0089_MW236_220906, 0089_MW268_220906, 0089_MW269_220906, 0089_MW226_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW288_220906, 0089_MW233_220906, 0089_MW203_220906, 0089_MW236_220906, 0089_MW268_220906, 0089_MW269_220906, 0089_MW226_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 42058 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted]
QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW373		06/09/2022 09:00 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_PW346		06/09/2022 09:10 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_SW372		06/09/2022 09:15 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
004	0089_SW317		06/09/2022 11:18 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
005	0089_SW318		06/09/2022 11:19 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
006	0089_SW319		06/09/2022 11:20 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_PW374		06/09/2022 11:24 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_PW375		06/09/2022 11:24 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_PW378		06/09/2022 11:25 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 42058 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_PW409		06/09/2022 12:53 PM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
011	0089_SW410		06/09/2022 12:56 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

(ALS) COC#: **42058** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW373	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW346	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_SW372	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW317	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW318	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_SW319	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_PW374	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_PW375	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW378	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **42058** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_PW409	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_SW410	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **42058** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW373	Clear Plastic Bottle - Natural	500 mL	00070821057271	Green	No	
001	0089_SW373	HDPE (no PTFE)	20 mL	00350821013004	Grey	No	
001	0089_SW373	HDPE (no PTFE)	20 mL	00350821012783	Grey	No	
001	0089_SW373	HDPE (no PTFE)	20 mL	00350821013037	Grey	No	
001	0089_SW373	HDPE (no PTFE)	20 mL	00350821012686	Grey	No	
002	0089_PW346	HDPE (no PTFE)	20 mL	00350821012949	Grey	No	
002	0089_PW346	Clear Plastic Bottle - Natural	500 mL	00070821039522	Green	No	
002	0089_PW346	HDPE (no PTFE)	20 mL	00350821012558	Grey	No	
003	0089_SW372	Clear Plastic Bottle - Natural	500 mL	00070821057274	Green	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350821012915	Grey	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350821013054	Grey	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350821012847	Grey	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00350821012907	Grey	No	
004	0089_SW317	HDPE (no PTFE)	20 mL	00350821012780	Grey	No	
004	0089_SW317	HDPE (no PTFE)	20 mL	00350821012936	Grey	No	
004	0089_SW317	Clear Plastic Bottle - Natural	500 mL	00070821039582	Green	No	
004	0089_SW317	HDPE (no PTFE)	20 mL	00350821012773	Grey	No	
004	0089_SW317	HDPE (no PTFE)	20 mL	00350821012820	Grey	No	
005	0089_SW318	HDPE (no PTFE)	20 mL	00350821012950	Grey	No	
005	0089_SW318	HDPE (no PTFE)	20 mL	00350821013014	Grey	No	
005	0089_SW318	Clear Plastic Bottle - Natural	500 mL	00070821057217	Green	No	
005	0089_SW318	HDPE (no PTFE)	20 mL	00350821012538	Grey	No	
005	0089_SW318	HDPE (no PTFE)	20 mL	00350821012682	Grey	No	
006	0089_SW319	Clear Plastic Bottle - Natural	500 mL	00070821039458	Green	No	
006	0089_SW319	HDPE (no PTFE)	20 mL	00350821012955	Grey	No	
006	0089_SW319	HDPE (no PTFE)	20 mL	00350821012556	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: **42058** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

007	0089_PW374	HDPE (no PTFE)	20 mL	00350821012898	Grey	No	
007	0089_PW374	Clear Plastic Bottle - Natural	500 mL	00070821039512	Green	No	
007	0089_PW374	HDPE (no PTFE)	20 mL	00350821013030	Grey	No	
008	0089_PW375	HDPE (no PTFE)	20 mL	00350821012942	Grey	No	
008	0089_PW375	Clear Plastic Bottle - Natural	500 mL	00070821057226	Green	No	
008	0089_PW375	HDPE (no PTFE)	20 mL	00350821012940	Grey	No	
009	0089_PW378	HDPE (no PTFE)	20 mL	00350821012870	Grey	No	
009	0089_PW378	HDPE (no PTFE)	20 mL	00350821012926	Grey	No	
009	0089_PW378	Clear Plastic Bottle - Natural	500 mL	00070821057275	Green	No	
010	0089_PW409	HDPE (no PTFE)	20 mL	00350821012480	Grey	No	
010	0089_PW409	Clear Plastic Bottle - Natural	500 mL	00070821039506	Green	No	
010	0089_PW409	HDPE (no PTFE)	20 mL	00350821012602	Grey	No	
010	0089_PW409	HDPE (no PTFE)	20 mL	00352101057725	Grey	No	
010	0089_PW409	HDPE (no PTFE)	20 mL	00350821013015	Grey	No	
011	0089_SW410	Clear Plastic Bottle - Natural	500 mL	00070821057256	Green	No	
011	0089_SW410	HDPE (no PTFE)	20 mL	00350821013065	Grey	No	
011	0089_SW410	HDPE (no PTFE)	20 mL	00350821012613	Grey	No	

Total Bottle Count: ALS: 43, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211391**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42058	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 16:00	Issue Date	: 09-Sep-2022
Client Requested Due Date	: 21-Sep-2022	Scheduled Reporting Date	: **21-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211391-001	06-Sep-2022 09:00	0089_SW373_220906	✓	✓	✓	✓
EP2211391-002	06-Sep-2022 09:10	0089_PW346_220906	✓	✓	✓	✓
EP2211391-003	06-Sep-2022 09:15	0089_SW372_220906	✓	✓	✓	✓
EP2211391-004	06-Sep-2022 11:18	0089_SW317_220906	✓	✓	✓	✓
EP2211391-005	06-Sep-2022 11:19	0089_SW318_220906	✓	✓	✓	✓
EP2211391-006	06-Sep-2022 11:20	0089_SW319_220906	✓	✓	✓	✓
EP2211391-007	06-Sep-2022 11:24	0089_PW374_220906	✓	✓	✓	✓
EP2211391-008	06-Sep-2022 11:24	0089_PW375_220906	✓	✓	✓	✓
EP2211391-009	06-Sep-2022 11:25	0089_PW378_220906	✓	✓	✓	✓
EP2211391-010	06-Sep-2022 12:53	0089_PW409_220906	✓	✓	✓	✓
EP2211391-011	06-Sep-2022 12:56	0089_SW410_220906	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211391**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 16:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42058	Issue Date	: 21-Sep-2022 14:34
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SW373_220906	0089_PW346_220906	0089_SW372_220906	0089_SW317_220906	0089_SW318_220906
				Sampling date / time	06-Sep-2022 09:00	06-Sep-2022 09:10	06-Sep-2022 09:15	06-Sep-2022 11:18	06-Sep-2022 11:19
					EP2211391-001	EP2211391-002	EP2211391-003	EP2211391-004	EP2211391-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**127**	**151**	**128**	**117**	**120**
Total Alkalinity as CaCO3	----	1	mg/L		**127**	**151**	**128**	**117**	**120**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2530**	**2480**	**2420**	**2470**	**2460**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17500**	**17100**	**17400**	**17400**	**17600**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**430**	**463**	**406**	**422**	**422**
Magnesium	7439-95-4	1	mg/L		**1380**	**1380**	**1300**	**1360**	**1370**
Sodium	7440-23-5	1	mg/L		**10700**	**10700**	**10100**	**10600**	**10700**
Potassium	7440-09-7	1	mg/L		**497**	**494**	**465**	**488**	**491**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**549**	**537**	**544**	**544**	**550**
ø Total Cations	----	0.01	meq/L		**613**	**615**	**578**	**606**	**612**
ø Ionic Balance	----	0.01	%		**5.53**	**6.75**	**3.09**	**5.38**	**5.31**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	**0.04**	**0.01**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.08**	**0.11**	**0.07**	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.02**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_220906	0089_PW346_220906	0089_SW372_220906	0089_SW317_220906	0089_SW318_220906
				Sampling date / time	06-Sep-2022 09:00	06-Sep-2022 09:10	06-Sep-2022 09:15	06-Sep-2022 11:18	06-Sep-2022 11:19
Compound	CAS Number	LOR	Unit		EP2211391-001	EP2211391-002	EP2211391-003	EP2211391-004	EP2211391-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_220906	0089_PW346_220906	0089_SW372_220906	0089_SW317_220906	0089_SW318_220906
				Sampling date / time	06-Sep-2022 09:00	06-Sep-2022 09:10	06-Sep-2022 09:15	06-Sep-2022 11:18	06-Sep-2022 11:19
Compound	CAS Number	LOR	Unit		EP2211391-001	EP2211391-002	EP2211391-003	EP2211391-004	EP2211391-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.09**	**0.17**	**0.08**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.09**	**0.15**	**0.08**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.09**	**0.17**	**0.08**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.3**	**99.2**	**92.4**	**95.8**	**97.7**
13C8-PFOA	----	0.02	%		**96.0**	**99.1**	**99.1**	**93.7**	**100**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW319_220906	0089_PW374_220906	0089_PW375_220906	0089_PW378_220906	0089_PW409_220906
				Sampling date / time	06-Sep-2022 11:20	06-Sep-2022 11:24	06-Sep-2022 11:24	06-Sep-2022 11:25	06-Sep-2022 12:53
Compound	CAS Number	LOR	Unit		EP2211391-006	EP2211391-007	EP2211391-008	EP2211391-009	EP2211391-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		120	127	210	131	159
Total Alkalinity as CaCO3	----	1	mg/L		120	127	210	131	159
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2480	2640	2290	2520	2500
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17800	17400	16700	17500	17400
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		426	426	416	441	462
Magnesium	7439-95-4	1	mg/L		1390	1380	1270	1410	1460
Sodium	7440-23-5	1	mg/L		10800	10700	9750	11000	11400
Potassium	7440-09-7	1	mg/L		494	493	468	502	525
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		556	548	523	549	546
ø Total Cations	----	0.01	meq/L		618	613	561	629	652
ø Ionic Balance	----	0.01	%		5.27	5.56	3.54	6.84	8.88
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.01	0.03	0.02	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW319_220906	0089_PW374_220906	0089_PW375_220906	0089_PW378_220906	0089_PW409_220906
				Sampling date / time	06-Sep-2022 11:20	06-Sep-2022 11:24	06-Sep-2022 11:24	06-Sep-2022 11:25	06-Sep-2022 12:53
Compound	CAS Number	LOR	Unit		EP2211391-006	EP2211391-007	EP2211391-008	EP2211391-009	EP2211391-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW319_220906	0089_PW374_220906	0089_PW375_220906	0089_PW378_220906	0089_PW409_220906
				Sampling date / time	06-Sep-2022 11:20	06-Sep-2022 11:24	06-Sep-2022 11:24	06-Sep-2022 11:25	06-Sep-2022 12:53
Compound	CAS Number	LOR	Unit		EP2211391-006	EP2211391-007	EP2211391-008	EP2211391-009	EP2211391-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.01**	**0.03**	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.01**	**0.03**	**0.02**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.01**	**0.03**	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.3**	**86.2**	**94.5**	**95.2**	**91.7**
13C8-PFOA	----	0.02	%		**95.7**	**92.3**	**96.0**	**90.2**	**97.0**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_220906	----	----	----	----
				Sampling date / time	06-Sep-2022 12:56	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211391-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**120**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**120**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2470**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17100**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**427**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1370**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**10600**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**494**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**536**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**608**	----	----	----	----
ø Ionic Balance	----	0.01	%		**6.26**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_220906	----	----	----	----
				Sampling date / time	06-Sep-2022 12:56	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211391-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_220906	----	----	----	----
				Sampling date / time	06-Sep-2022 12:56	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211391-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.8**	----	----	----	----
13C8-PFOA	----	0.02	%		**97.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211391**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42058	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4586679)									
EP2211390-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	384	389	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	384	389	1.5	0% - 20%
EP2211391-009	0089_PW378_220906	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	131	127	2.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	131	127	2.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4572080)									
EP2211390-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	41	40	0.0	0% - 20%
EP2211391-004	0089_SW317_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2470	2470	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4572079)									
EP2211390-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	52	53	2.0	0% - 20%
EP2211391-004	0089_SW317_220906	ED045G: Chloride	16887-00-6	1	mg/L	17400	17200	1.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4572111)									
EP2211390-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	68	69	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	58	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	180	181	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%
EP2211391-009	0089_PW378_220906	ED093F: Calcium	7440-70-2	1	mg/L	441	449	1.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1440	2.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	11200	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	502	509	1.4	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4588983)									
EP2211390-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	4.63	4.62	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2211391-004	0089_SW317_220906	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4588983)									
EP2211390-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2211391-004	0089_SW317_220906	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4588983)									
EP2211390-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4588983) - continued									
EP2211390-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211391-004	0089_SW317_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4588983)									
EP2211390-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211391-004	0089_SW317_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4588983)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4588983) - continued									
EP2211390-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	4.65	4.64	0.2	0% - 20%
EP2211391-004	0089_SW317_220906	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4586679)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	97.8	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4572080)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.7	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4572079)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.6	88.6	113
				<1	1000 mg/L	94.7	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4572111)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	109	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588983)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	79.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	93.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	86.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	87.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	86.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	87.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588983)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	101	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588983) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588983)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	97.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.5	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.9	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	96.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588983)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	89.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	90.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	81.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4572080)							
EP2211390-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	111	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4572079)							
EP2211390-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	95.8	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588983)							
EP2211390-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	114	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	118	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	115	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	113	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	138	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	112	53.0	142

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588983)							
EP2211390-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	118	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	118	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	117	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	122	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	117	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	117	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	118	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	114	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	110	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	122	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588983)							
EP2211390-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	126	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	121	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	112	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	125	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	117	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588983)							
EP2211390-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	123	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	109	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211391**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SW/PW - JS	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW373_220906, 0089_PW346_220906, 0089_SW372_220906, 0089_SW317_220906, 0089_SW318_220906, 0089_SW319_220906, 0089_PW374_220906, 0089_PW375_220906, 0089_PW378_220906, 0089_PW409_220906, 0089_SW410_220906	**06-Sep-2022**	**----**	----	----	**17-Sep-2022**	20-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW373_220906, 0089_PW346_220906, 0089_SW372_220906, 0089_SW317_220906, 0089_SW318_220906, 0089_SW319_220906, 0089_PW374_220906, 0089_PW375_220906, 0089_PW378_220906, 0089_PW409_220906, 0089_SW410_220906	**06-Sep-2022**	**----**	----	----	**14-Sep-2022**	04-Oct-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW373_220906, 0089_PW346_220906, 0089_SW372_220906, 0089_SW317_220906, 0089_SW318_220906, 0089_SW319_220906, 0089_PW374_220906, 0089_PW375_220906, 0089_PW378_220906, 0089_PW409_220906, 0089_SW410_220906	**06-Sep-2022**	**----**	----	----	**14-Sep-2022**	04-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW373_220906, 0089_PW346_220906, 0089_SW372_220906, 0089_SW317_220906, 0089_SW318_220906, 0089_SW319_220906, 0089_PW374_220906, 0089_PW375_220906, 0089_PW378_220906, 0089_PW409_220906, 0089_SW410_220906	**06-Sep-2022**	**----**	----	----	**12-Sep-2022**	13-Sep-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW373_220906, 0089_SW372_220906, 0089_SW318_220906, 0089_PW374_220906, 0089_PW378_220906, 0089_SW410_220906, 0089_PW346_220906, 0089_SW317_220906, 0089_SW319_220906, 0089_PW375_220906, 0089_PW409_220906,	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW373_220906, 0089_SW372_220906, 0089_SW318_220906, 0089_PW374_220906, 0089_PW378_220906, 0089_SW410_220906, 0089_PW346_220906, 0089_SW317_220906, 0089_SW319_220906, 0089_PW375_220906, 0089_PW409_220906,	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW373_220906, 0089_SW372_220906, 0089_SW318_220906, 0089_PW374_220906, 0089_PW378_220906, 0089_SW410_220906, 0089_PW346_220906, 0089_SW317_220906, 0089_SW319_220906, 0089_PW375_220906, 0089_PW409_220906,	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW373_220906, 0089_SW372_220906, 0089_SW318_220906, 0089_PW374_220906, 0089_PW378_220906, 0089_SW410_220906, 0089_PW346_220906, 0089_SW317_220906, 0089_SW319_220906, 0089_PW375_220906, 0089_PW409_220906,	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW373_220906, 0089_SW372_220906, 0089_SW318_220906, 0089_PW374_220906, 0089_PW378_220906, 0089_SW410_220906, 0089_PW346_220906, 0089_SW317_220906, 0089_SW319_220906, 0089_PW375_220906, 0089_PW409_220906,	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: **42059** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD346		06/09/2022 09:14 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD374		06/09/2022 11:22 AM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD375		06/09/2022 11:23 AM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_SD378		06/09/2022 11:23 AM	Soil	ALS: 1 Non ALS: 0	No	X		
005	0089_SD409		06/09/2022 12:54 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 42059 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD346	HDPE Soil Jar	200 mL	00620322012243	Grey	No	
002	0089_SD374	HDPE Soil Jar	200 mL	00620322012286	Grey	No	
003	0089_SD375	HDPE Soil Jar	200 mL	00620322012163	Grey	No	
004	0089_SD378	HDPE Soil Jar	200 mL	00620322012220	Grey	No	
005	0089_SD409	HDPE Soil Jar	200 mL	00620322012218	Grey	No	

Total Bottle Count: ALS: 5, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211393**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42059	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 16:00	Issue Date	: 09-Sep-2022
Client Requested Due Date	: 21-Sep-2022	Scheduled Reporting Date	: **21-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2211393-001	06-Sep-2022 09:14	0089_SD346_220906	✓	✓
EP2211393-002	06-Sep-2022 11:22	0089_SD374_220906	✓	✓
EP2211393-003	06-Sep-2022 11:23	0089_SD375_220906	✓	✓
EP2211393-004	06-Sep-2022 11:23	0089_SD378_220906	✓	✓
EP2211393-005	06-Sep-2022 12:54	0089_SD409_220906	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211393**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 16:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Sep-2022
C-O-C number	: 42059	Issue Date	: 21-Sep-2022 14:35
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD346_220906	0089_SD374_220906	0089_SD375_220906	0089_SD378_220906	0089_SD409_220906
				Sampling date / time	06-Sep-2022 09:14	06-Sep-2022 11:22	06-Sep-2022 11:23	06-Sep-2022 11:23	06-Sep-2022 12:54
					EP2211393-001	EP2211393-002	EP2211393-003	EP2211393-004	EP2211393-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**28.1**	**18.4**	**19.3**	**20.2**	**29.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0025**	**0.0006**	**0.0003**	**0.0002**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD346_220906	0089_SD374_220906	0089_SD375_220906	0089_SD378_220906	0089_SD409_220906
				Sampling date / time	06-Sep-2022 09:14	06-Sep-2022 11:22	06-Sep-2022 11:23	06-Sep-2022 11:23	06-Sep-2022 12:54
Compound	CAS Number	LOR	Unit		EP2211393-001	EP2211393-002	EP2211393-003	EP2211393-004	EP2211393-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0025**	**0.0006**	**0.0003**	**0.0002**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0025**	**0.0006**	**0.0003**	**0.0002**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0025**	**0.0006**	**0.0003**	**0.0002**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**87.5**	**105**	**108**	**100**
13C8-PFOA	----	0.0002	%		**100**	**106**	**104**	**106**	**101**

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211393**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Sep-2022
C-O-C number	: 42059	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4592004)									
EP2211393-003	0089_SD375_220906	EA055: Moisture Content	----	0.1	%	19.3	19.3	0.0	0% - 20%
EP2211402-009	Anonymous	EA055: Moisture Content	----	0.1	%	29.0	29.6	2.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4586616)									
EP2211393-001	0089_SD346_220906	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0025	0.0023	8.5	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2211402-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4586616)									
EP2211393-001	0089_SD346_220906	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4586616) - continued									
EP2211393-001	0089_SD346_220906	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2211402-006	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4586616)									
EP2211393-001	0089_SD346_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211402-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4586616)									
EP2211393-001	0089_SD346_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211402-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4586616)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4586616)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	89.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586616)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.5	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586616)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	78.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	96.8	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586616) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	85.2	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4586616)							
EP2211393-001	0089_SD346_220906	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	105	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	102	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	116	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	81.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	110	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4586616)							
EP2211393-001	0089_SD346_220906	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	94.5	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	114	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	129	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	108	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	116	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	120	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	112	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	123	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	117	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	99.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	117	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586616)							
EP2211393-001	0089_SD346_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	97.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	118	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	112	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	116	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	116	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	123	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586616) - continued							
EP2211393-001	0089_SD346_220906	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	124	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586616)							
EP2211393-001	0089_SD346_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	117	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	92.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	118	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	104	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211393**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SD - JS	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD346_220906, 0089_SD374_220906, 0089_SD375_220906, 0089_SD378_220906, 0089_SD409_220906	**06-Sep-2022**	**----**	----	----	**20-Sep-2022**	20-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD346_220906, 0089_SD374_220906, 0089_SD375_220906, 0089_SD378_220906, 0089_SD409_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD346_220906, 0089_SD374_220906, 0089_SD375_220906, 0089_SD378_220906, 0089_SD409_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD346_220906, 0089_SD374_220906, 0089_SD375_220906, 0089_SD378_220906, 0089_SD409_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD346_220906, 0089_SD374_220906, 0089_SD375_220906, 0089_SD378_220906, 0089_SD409_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD346_220906, 0089_SD374_220906, 0089_SD375_220906, 0089_SD378_220906, 0089_SD409_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 42054 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW172		06/09/2022 08:51 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
002	0089_MW214		06/09/2022 09:46 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
003	0089_MW215		06/09/2022 10:09 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS
004	0089_MW225		06/09/2022 10:28 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		Extra Lab QAQC PFAS

CHAIN OF CUSTODY

ALS COC#: 42054 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted]
QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW172	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW214	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW215	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW225	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **42054** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted]
QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW172	Clear Plastic Bottle - Natural	500 mL	00070821039593	Green	No	
001	0089_MW172	HDPE (no PTFE)	20 mL	00350821012865	Grey	No	
001	0089_MW172	HDPE (no PTFE)	20 mL	00350821012810	Grey	No	
001	0089_MW172	HDPE (no PTFE)	20 mL	00350821012948	Grey	No	
001	0089_MW172	HDPE (no PTFE)	20 mL	00350821012980	Grey	No	
002	0089_MW214	Clear Plastic Bottle - Natural	500 mL	00070821057265	Green	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00350821012851	Grey	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00350821012967	Grey	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00350821013039	Grey	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00350821013019	Grey	No	
003	0089_MW215	Clear Plastic Bottle - Natural	500 mL	00070821041334	Green	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350821012830	Grey	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350821012841	Grey	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350821012993	Grey	No	
003	0089_MW215	HDPE (no PTFE)	20 mL	00350821012932	Grey	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350821012799	Grey	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350821012833	Grey	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350821012905	Grey	No	
004	0089_MW225	Clear Plastic Bottle - Natural	500 mL	00070821039591	Green	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00350821012812	Grey	No	

Total Bottle Count: ALS: 20, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211400**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42054	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 16:00	Issue Date	: 12-Sep-2022
Client Requested Due Date	: 21-Sep-2022	Scheduled Reporting Date	: **21-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211400-001	06-Sep-2022 08:51	0089_MW172_220906	✓	✓	✓	✓
EP2211400-002	06-Sep-2022 09:46	0089_MW214_220906	✓	✓	✓	✓
EP2211400-003	06-Sep-2022 10:09	0089_MW215_220906	✓	✓	✓	✓
EP2211400-004	06-Sep-2022 10:28	0089_MW225_220906	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211400**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 16:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42054	Issue Date	: 21-Sep-2022 14:41
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW172_220906	0089_MW214_220906	0089_MW215_220906	0089_MW225_220906	----
				Sampling date / time	06-Sep-2022 08:51	06-Sep-2022 09:46	06-Sep-2022 10:09	06-Sep-2022 10:28	----
Compound	CAS Number	LOR	Unit		EP2211400-001	EP2211400-002	EP2211400-003	EP2211400-004	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**404**	**471**	**311**	**314**	----
Total Alkalinity as CaCO3	----	1	mg/L		**404**	**471**	**311**	**314**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**203**	**9**	**84**	**46**	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1110**	**643**	**466**	**425**	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**99**	**202**	**142**	**124**	----
Magnesium	7439-95-4	1	mg/L		**117**	**46**	**38**	**39**	----
Sodium	7440-23-5	1	mg/L		**602**	**258**	**201**	**174**	----
Potassium	7440-09-7	1	mg/L		**48**	**8**	**11**	**6**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**43.6**	**27.7**	**21.1**	**19.2**	----
ø Total Cations	----	0.01	meq/L		**42.0**	**25.3**	**19.2**	**17.1**	----
ø Ionic Balance	----	0.01	%		**1.90**	**4.61**	**4.64**	**5.78**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**1.34**	<0.02	**0.09**	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**1.29**	<0.02	**0.13**	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**12.2**	<0.01	**0.73**	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**2.37**	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**17.4**	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.5**	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.61**	<0.02	**0.07**	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**2.52**	<0.02	**0.24**	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.23**	<0.02	**0.03**	<0.02	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW172_220906	0089_MW214_220906	0089_MW215_220906	0089_MW225_220906	----
				Sampling date / time	06-Sep-2022 08:51	06-Sep-2022 09:46	06-Sep-2022 10:09	06-Sep-2022 10:28	----
Compound	CAS Number	LOR	Unit		EP2211400-001	EP2211400-002	EP2211400-003	EP2211400-004	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.59**	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW172_220906	0089_MW214_220906	0089_MW215_220906	0089_MW225_220906	----
				Sampling date / time	06-Sep-2022 08:51	06-Sep-2022 09:46	06-Sep-2022 10:09	06-Sep-2022 10:28	----
Compound	CAS Number	LOR	Unit		EP2211400-001	EP2211400-002	EP2211400-003	EP2211400-004	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**39.0**	<0.01	**1.29**	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**29.6**	<0.01	**0.73**	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**35.4**	<0.01	**1.16**	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**88.4**	**96.4**	**91.4**	**92.3**	----
13C8-PFOA	----	0.02	%		**96.4**	**96.6**	**95.2**	**96.2**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211400**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42054	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4586679)									
EP2211390-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	384	389	1.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	384	389	1.5	0% - 20%
EP2211391-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	131	127	2.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	131	127	2.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4577895)									
EP2211400-001	0089_MW172_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	203	184	10.3	0% - 20%
EP2211663-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	22	22	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4577894)									
EP2211400-001	0089_MW172_220906	ED045G: Chloride	16887-00-6	1	mg/L	1110	1080	2.1	0% - 20%
EP2211663-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	156	155	1.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4575053)									
EP2211400-001	0089_MW172_220906	ED093F: Calcium	7440-70-2	1	mg/L	99	98	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	117	117	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	602	600	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	48	48	0.0	0% - 20%
EP2211663-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	14	15	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	8	8	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	129	127	1.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	41	40	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4588985)									
EP2211400-001	0089_MW172_220906	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	12.2	11.7	4.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	17.4	18.6	6.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.34	1.45	8.2	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.29	1.43	10.1	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	2.37	2.67	11.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2211400-003	0089_MW215_220906	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.73	0.77	6.1	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.09	0.09	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.13	0.14	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4588985)									
EP2211400-001	0089_MW172_220906	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.59	0.60	2.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.61	0.67	9.2	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.52	2.73	8.2	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.23	0.25	8.3	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.5	0.6	0.0	No Limit
EP2211400-003	0089_MW215_220906	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.24	0.25	5.5	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4588985)									
EP2211400-001	0089_MW172_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4588985) - continued									
EP2211400-001	0089_MW172_220906	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211400-003	0089_MW215_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4588985)									
EP2211400-001	0089_MW172_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211400-003	0089_MW215_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4588985)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4588985) - continued									
EP2211400-001	0089_MW172_220906	EP231X: Sum of PFAS	----	0.01	µg/L	39.0	40.7	4.1	0% - 20%
EP2211400-003	0089_MW215_220906	EP231X: Sum of PFAS	----	0.01	µg/L	1.29	1.36	5.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4586679)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	97.8	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4577895)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.8	89.9	112
				<1	500 mg/L	98.2	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4577894)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.6	88.6	113
				<1	1000 mg/L	102	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4575053)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	113	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588985)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	87.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	90.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	84.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	93.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	87.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	80.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588985)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	83.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	91.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	87.8	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588985) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	97.5	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588985)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	90.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588985)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	83.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	95.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	112	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	90.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4577895)							
EP2211400-001	0089_MW172_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	124	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4577894)							
EP2211400-001	0089_MW172_220906	ED045G: Chloride	16887-00-6	1000 mg/L	93.3	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588985)							
EP2211400-002	0089_MW214_220906	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	106	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	117	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	115	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	120	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	110	53.0	142

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588985)							
EP2211400-002	0089_MW214_220906	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	119	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	118	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	121	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	109	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	112	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	106	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	116	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	116	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	119	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	127	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588985)							
EP2211400-002	0089_MW214_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	111	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	127	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	105	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.5	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	126	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	112	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	105	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588985)							
EP2211400-002	0089_MW214_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	118	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	117	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	119	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	93.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211400**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling GW - CG	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW172_220906, 0089_MW214_220906, 0089_MW215_220906, 0089_MW225_220906	**06-Sep-2022**	**----**	----	----	**17-Sep-2022**	20-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW172_220906, 0089_MW214_220906, 0089_MW215_220906, 0089_MW225_220906	**06-Sep-2022**	**----**	----	----	**16-Sep-2022**	04-Oct-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW172_220906, 0089_MW214_220906, 0089_MW215_220906, 0089_MW225_220906	**06-Sep-2022**	**----**	----	----	**16-Sep-2022**	04-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW172_220906, 0089_MW214_220906, 0089_MW215_220906, 0089_MW225_220906	**06-Sep-2022**	**----**	----	----	**13-Sep-2022**	13-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW172_220906, 0089_MW214_220906, 0089_MW215_220906, 0089_MW225_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW172_220906, 0089_MW214_220906, 0089_MW215_220906, 0089_MW225_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW172_220906, 0089_MW214_220906, 0089_MW215_220906, 0089_MW225_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW172_220906, 0089_MW214_220906, 0089_MW215_220906, 0089_MW225_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW172_220906, 0089_MW214_220906, 0089_MW215_220906, 0089_MW225_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **42055** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW311		06/09/2022 11:00 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW308		06/09/2022 11:01 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW316		06/09/2022 11:02 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW309		06/09/2022 11:02 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_PW306		06/09/2022 11:03 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW307		06/09/2022 11:04 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_SW310		06/09/2022 11:04 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_PW315		06/09/2022 11:05 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_PW314		06/09/2022 11:06 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: **42055** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free Ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW412		06/09/2022 12:47 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_PW411		06/09/2022 12:49 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_SW414		06/09/2022 12:50 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
013	0089_PW413		06/09/2022 12:51 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0089_SW416		06/09/2022 12:52 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
015	0089_PW415		06/09/2022 12:53 PM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: **42055** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW311	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW308	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW316	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW309	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_PW306	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW307	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_SW310	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_PW315	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW314	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: **42055** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_SW412	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_PW411	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_SW414	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0089_PW413	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0089_SW416	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0089_PW415	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: **42055** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW311	HDPE (no PTFE)	20 mL	00350821012669	Grey	No	
001	0089_SW311	Clear Plastic Bottle - Natural	500 mL	00070821039435	Green	No	
001	0089_SW311	HDPE (no PTFE)	20 mL	00350821012604	Grey	No	
002	0089_PW308	Clear Plastic Bottle - Natural	500 mL	00070821039474	Green	No	
002	0089_PW308	HDPE (no PTFE)	20 mL	00350821012524	Grey	No	
002	0089_PW308	HDPE (no PTFE)	20 mL	00350821012498	Grey	No	
003	0089_PW316	Clear Plastic Bottle - Natural	500 mL	00070821039554	Green	No	
003	0089_PW316	HDPE (no PTFE)	20 mL	00350821012614	Grey	No	
003	0089_PW316	HDPE (no PTFE)	20 mL	00350821013057	Grey	No	
004	0089_SW309	Clear Plastic Bottle - Natural	500 mL	00070821039570	Green	No	
004	0089_SW309	HDPE (no PTFE)	20 mL	00350821012677	Grey	No	
004	0089_SW309	HDPE (no PTFE)	20 mL	00350821012965	Grey	No	
005	0089_PW306	Clear Plastic Bottle - Natural	500 mL	00070821057236	Green	No	
005	0089_PW306	HDPE (no PTFE)	20 mL	00350821013024	Grey	No	
005	0089_PW306	HDPE (no PTFE)	20 mL	00350821012947	Grey	No	
006	0089_PW307	Clear Plastic Bottle - Natural	500 mL	00070821039531	Green	No	
006	0089_PW307	HDPE (no PTFE)	20 mL	00350821012623	Grey	No	
006	0089_PW307	HDPE (no PTFE)	20 mL	00350821012571	Grey	No	
007	0089_SW310	Clear Plastic Bottle - Natural	500 mL	00070821039470	Green	No	
007	0089_SW310	HDPE (no PTFE)	20 mL	00350821012705	Grey	No	
007	0089_SW310	HDPE (no PTFE)	20 mL	00350821013049	Grey	No	
008	0089_PW315	Clear Plastic Bottle - Natural	500 mL	00070821039586	Green	No	
008	0089_PW315	HDPE (no PTFE)	20 mL	00350821012978	Grey	No	
008	0089_PW315	HDPE (no PTFE)	20 mL	00350821012636	Grey	No	
009	0089_PW314	Clear Plastic Bottle - Natural	500 mL	00070821039431	Green	No	
009	0089_PW314	HDPE (no PTFE)	20 mL	00350821012591	Grey	No	

CHAIN OF CUSTODY

ALS COC#: **42055** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW314	HDPE (no PTFE)	20 mL	00350821012482	Grey	No	
010	0089_SW412	Clear Plastic Bottle - Natural	500 mL	00070821039578	Green	No	
010	0089_SW412	HDPE (no PTFE)	20 mL	00350821012801	Grey	No	
010	0089_SW412	HDPE (no PTFE)	20 mL	00350821012839	Grey	No	
011	0089_PW411	Clear Plastic Bottle - Natural	500 mL	00070821039509	Green	No	
011	0089_PW411	HDPE (no PTFE)	20 mL	00350821012526	Grey	No	
011	0089_PW411	HDPE (no PTFE)	20 mL	00350821012653	Grey	No	
012	0089_SW414	Clear Plastic Bottle - Natural	500 mL	00070821039559	Green	No	
012	0089_SW414	HDPE (no PTFE)	20 mL	00350821012691	Grey	No	
012	0089_SW414	HDPE (no PTFE)	20 mL	00350821012486	Grey	No	
013	0089_PW413	Clear Plastic Bottle - Natural	500 mL	00070821039501	Green	No	
013	0089_PW413	HDPE (no PTFE)	20 mL	00350821012663	Grey	No	
013	0089_PW413	HDPE (no PTFE)	20 mL	00350821012608	Grey	No	
014	0089_SW416	Clear Plastic Bottle - Natural	500 mL	00070821057258	Green	No	
014	0089_SW416	HDPE (no PTFE)	20 mL	00350821012567	Grey	No	
014	0089_SW416	HDPE (no PTFE)	20 mL	00350821012557	Grey	No	
015	0089_PW415	Clear Plastic Bottle - Natural	500 mL	00070821057270	Green	No	
015	0089_PW415	HDPE (no PTFE)	20 mL	00350821012720	Grey	No	
015	0089_PW415	HDPE (no PTFE)	20 mL	00350821012759	Grey	No	

Total Bottle Count: ALS: 45, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211401**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42055	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 16:00	Issue Date	: 09-Sep-2022
Client Requested Due Date	: 21-Sep-2022	Scheduled Reporting Date	: **21-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211401-001	06-Sep-2022 11:00	0089_SW311_220906	✓	✓	✓	✓
EP2211401-002	06-Sep-2022 11:01	0089_PW308_220906	✓	✓	✓	✓
EP2211401-003	06-Sep-2022 11:02	0089_PW316_220906	✓	✓	✓	✓
EP2211401-004	06-Sep-2022 11:02	0089_SW309_220906	✓	✓	✓	✓
EP2211401-005	06-Sep-2022 11:03	0089_PW306_220906	✓	✓	✓	✓
EP2211401-006	06-Sep-2022 11:04	0089_PW307_220906	✓	✓	✓	✓
EP2211401-007	06-Sep-2022 11:04	0089_SW310_220906	✓	✓	✓	✓
EP2211401-008	06-Sep-2022 11:05	0089_PW315_220906	✓	✓	✓	✓
EP2211401-009	06-Sep-2022 11:06	0089_PW314_220906	✓	✓	✓	✓
EP2211401-010	06-Sep-2022 12:47	0089_SW412_220906	✓	✓	✓	✓
EP2211401-011	06-Sep-2022 12:49	0089_PW411_220906	✓	✓	✓	✓
EP2211401-012	06-Sep-2022 12:50	0089_SW414_220906	✓	✓	✓	✓
EP2211401-013	06-Sep-2022 12:51	0089_PW413_220906	✓	✓	✓	✓
EP2211401-014	06-Sep-2022 12:52	0089_SW416_220906	✓	✓	✓	✓
EP2211401-015	06-Sep-2022 12:53	0089_PW415_220906	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211401**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 16:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42055	Issue Date	: 21-Sep-2022 14:36
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW311_220906	0089_PW308_220906	0089_PW316_220906	0089_SW309_220906	0089_PW306_220906
				Sampling date / time	06-Sep-2022 11:00	06-Sep-2022 11:01	06-Sep-2022 11:02	06-Sep-2022 11:02	06-Sep-2022 11:03
Compound	CAS Number	LOR	Unit		EP2211401-001	EP2211401-002	EP2211401-003	EP2211401-004	EP2211401-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		118	114	119	118	117
Total Alkalinity as CaCO3	----	1	mg/L		118	114	119	118	117
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2670	2620	2620	2620	2640
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18600	19000	18800	18300	18200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		444	417	431	432	434
Magnesium	7439-95-4	1	mg/L		1430	1350	1380	1400	1390
Sodium	7440-23-5	1	mg/L		11100	10500	10800	10800	10800
Potassium	7440-09-7	1	mg/L		506	477	496	500	494
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		583	593	587	573	571
ø Total Cations	----	0.01	meq/L		636	601	618	619	618
ø Ionic Balance	----	0.01	%		4.35	0.67	2.51	3.88	4.02
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW311_220906	0089_PW308_220906	0089_PW316_220906	0089_SW309_220906	0089_PW306_220906
				Sampling date / time	06-Sep-2022 11:00	06-Sep-2022 11:01	06-Sep-2022 11:02	06-Sep-2022 11:02	06-Sep-2022 11:03
Compound	CAS Number	LOR	Unit		EP2211401-001	EP2211401-002	EP2211401-003	EP2211401-004	EP2211401-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW311_220906	0089_PW308_220906	0089_PW316_220906	0089_SW309_220906	0089_PW306_220906
				Sampling date / time	06-Sep-2022 11:00	06-Sep-2022 11:01	06-Sep-2022 11:02	06-Sep-2022 11:02	06-Sep-2022 11:03
Compound	CAS Number	LOR	Unit		EP2211401-001	EP2211401-002	EP2211401-003	EP2211401-004	EP2211401-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.6**	**97.6**	**99.1**	**101**	**85.7**
13C8-PFOA	----	0.02	%		**92.4**	**98.7**	**95.7**	**97.7**	**95.1**

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW307_220906	0089_SW310_220906	0089_PW315_220906	0089_PW314_220906	0089_SW412_220906
				Sampling date / time	06-Sep-2022 11:04	06-Sep-2022 11:04	06-Sep-2022 11:05	06-Sep-2022 11:06	06-Sep-2022 12:47
					EP2211401-006	EP2211401-007	EP2211401-008	EP2211401-009	EP2211401-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**122**	**118**	**118**	**118**	**119**
Total Alkalinity as CaCO3	----	1	mg/L		**122**	**118**	**118**	**118**	**119**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2610**	**2600**	**2600**	**2600**	**2540**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17800**	**20400**	**18400**	**18800**	**18900**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**437**	**421**	**434**	**421**	**438**
Magnesium	7439-95-4	1	mg/L		**1420**	**1360**	**1400**	**1360**	**1400**
Sodium	7440-23-5	1	mg/L		**11000**	**10600**	**10900**	**10600**	**10900**
Potassium	7440-09-7	1	mg/L		**506**	**483**	**499**	**485**	**496**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**559**	**632**	**576**	**587**	**588**
ø Total Cations	----	0.01	meq/L		**630**	**606**	**624**	**606**	**624**
ø Ionic Balance	----	0.01	%		**5.99**	**2.07**	**4.02**	**1.64**	**2.93**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW307_220906	0089_SW310_220906	0089_PW315_220906	0089_PW314_220906	0089_SW412_220906
				Sampling date / time	06-Sep-2022 11:04	06-Sep-2022 11:04	06-Sep-2022 11:05	06-Sep-2022 11:06	06-Sep-2022 12:47
Compound	CAS Number	LOR	Unit		EP2211401-006	EP2211401-007	EP2211401-008	EP2211401-009	EP2211401-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW307_220906	0089_SW310_220906	0089_PW315_220906	0089_PW314_220906	0089_SW412_220906
				Sampling date / time	06-Sep-2022 11:04	06-Sep-2022 11:04	06-Sep-2022 11:05	06-Sep-2022 11:06	06-Sep-2022 12:47
Compound	CAS Number	LOR	Unit		EP2211401-006	EP2211401-007	EP2211401-008	EP2211401-009	EP2211401-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.8**	**92.3**	**97.3**	**94.9**	**97.2**
13C8-PFOA	----	0.02	%		**97.3**	**96.9**	**92.1**	**93.9**	**94.5**

Analytical Results

Sub-Matrix: **SURFACE WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_PW411_220906	0089_SW414_220906	0089_PW413_220906	0089_SW416_220906	0089_PW415_220906
				Sampling date / time	06-Sep-2022 12:49	06-Sep-2022 12:50	06-Sep-2022 12:51	06-Sep-2022 12:52	06-Sep-2022 12:53
					EP2211401-011	EP2211401-012	EP2211401-013	EP2211401-014	EP2211401-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**126**	**119**	**128**	**118**	**135**
Total Alkalinity as CaCO3	----	1	mg/L		**126**	**119**	**128**	**118**	**135**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2740**	**2580**	**2640**	**2580**	**2630**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18300**	**18400**	**18600**	**18400**	**18800**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**414**	**420**	**435**	**434**	**446**
Magnesium	7439-95-4	1	mg/L		**1330**	**1360**	**1370**	**1400**	**1420**
Sodium	7440-23-5	1	mg/L		**10300**	**10500**	**10600**	**10800**	**11000**
Potassium	7440-09-7	1	mg/L		**475**	**481**	**492**	**502**	**507**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**576**	**575**	**582**	**575**	**588**
ø Total Cations	----	0.01	meq/L		**590**	**602**	**608**	**619**	**630**
ø Ionic Balance	----	0.01	%		**1.24**	**2.28**	**2.18**	**3.71**	**3.51**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW411_220906	0089_SW414_220906	0089_PW413_220906	0089_SW416_220906	0089_PW415_220906
				Sampling date / time	06-Sep-2022 12:49	06-Sep-2022 12:50	06-Sep-2022 12:51	06-Sep-2022 12:52	06-Sep-2022 12:53
Compound	CAS Number	LOR	Unit		EP2211401-011	EP2211401-012	EP2211401-013	EP2211401-014	EP2211401-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW411_220906	0089_SW414_220906	0089_PW413_220906	0089_SW416_220906	0089_PW415_220906
			Sampling date / time	06-Sep-2022 12:49	06-Sep-2022 12:50	06-Sep-2022 12:51	06-Sep-2022 12:52	06-Sep-2022 12:53
Compound	CAS Number	LOR	Unit	EP2211401-011	EP2211401-012	EP2211401-013	EP2211401-014	EP2211401-015
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**97.2**	**87.3**	**91.7**	**89.9**	**96.1**
13C8-PFOA	----	0.02	%	**95.8**	**95.5**	**93.6**	**91.9**	**95.6**

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211401**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42055	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4588454)									
EP2211401-002	0089_PW308_220906	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	114	117	2.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	114	117	2.3	0% - 20%
EP2211401-012	0089_SW414_220906	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	119	117	1.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	119	117	1.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4572078)									
EP2211401-001	0089_SW311_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2670	2620	1.6	0% - 20%
EP2211401-011	0089_PW411_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2590	5.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4572077)									
EP2211401-001	0089_SW311_220906	ED045G: Chloride	16887-00-6	1	mg/L	18600	18400	1.3	0% - 20%
EP2211401-011	0089_PW411_220906	ED045G: Chloride	16887-00-6	1	mg/L	18300	18600	1.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4572112)									
EP2211401-001	0089_SW311_220906	ED093F: Calcium	7440-70-2	1	mg/L	444	428	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1430	1380	3.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11100	10800	2.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	506	491	3.0	0% - 20%
EP2211401-011	0089_PW411_220906	ED093F: Calcium	7440-70-2	1	mg/L	414	436	5.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1330	1400	5.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10300	10800	5.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	475	503	5.6	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4588985)									
EP2211400-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	12.2	11.7	4.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	17.4	18.6	6.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.34	1.45	8.2	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.29	1.43	10.1	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	2.37	2.67	11.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2211400-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.73	0.77	6.1	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.09	0.09	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.13	0.14	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4588985)									
EP2211400-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.59	0.60	2.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.61	0.67	9.2	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.52	2.73	8.2	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.23	0.25	8.3	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.5	0.6	0.0	No Limit
EP2211400-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.24	0.25	5.5	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4588985)									
EP2211400-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4588985) - continued									
EP2211400-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211400-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4588985)									
EP2211400-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2211400-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4588985)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4588985) - continued									
EP2211400-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	39.0	40.7	4.1	0% - 20%
EP2211400-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	1.29	1.36	5.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4588454)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	115	87.8	118
				<1	200 mg/L	96.3	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4572078)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4572077)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	97.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4572112)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	117	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	110	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.8	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588985)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	87.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	90.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	84.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	93.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	87.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	80.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588985)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	83.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	91.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	87.8	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588985) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	97.5	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588985)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	90.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588985)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	83.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	95.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	112	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	90.8	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4572078)							
EP2211401-001	0089_SW311_220906	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4572077)							
EP2211401-001	0089_SW311_220906	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588985)							
EP2211400-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	106	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	117	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	115	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4588985) - continued							
EP2211400-002	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	120	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	110	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4588985)							
EP2211400-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	119	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	118	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	121	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	109	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	112	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	106	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	116	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	116	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	119	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	127	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4588985)							
EP2211400-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	111	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	127	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	105	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.5	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	126	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	112	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	105	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4588985)							
EP2211400-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	118	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	117	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	119	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	93.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211401**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SW/PW - CG	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 15
Order number	: pfas-omp/Stirling	No. of samples analysed	: 15

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211401--001	0089_SW311_220906	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2211401--001	0089_SW311_220906	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW311_220906, 0089_PW308_220906, 0089_PW316_220906, 0089_SW309_220906, 0089_PW306_220906, 0089_PW307_220906, 0089_SW310_220906, 0089_PW315_220906, 0089_PW314_220906, 0089_SW412_220906, 0089_PW411_220906, 0089_SW414_220906, 0089_PW413_220906, 0089_SW416_220906, 0089_PW415_220906	**06-Sep-2022**	**----**	----	----	**19-Sep-2022**	20-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW311_220906, 0089_PW308_220906, 0089_PW316_220906, 0089_SW309_220906, 0089_PW306_220906, 0089_PW307_220906, 0089_SW310_220906, 0089_PW315_220906, 0089_PW314_220906, 0089_SW412_220906, 0089_PW411_220906, 0089_SW414_220906, 0089_PW413_220906, 0089_SW416_220906, 0089_PW415_220906	**06-Sep-2022**	**----**	----	----	**20-Sep-2022**	04-Oct-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW311_220906, 0089_PW308_220906, 0089_PW316_220906, 0089_SW309_220906, 0089_PW306_220906, 0089_PW307_220906, 0089_SW310_220906, 0089_PW315_220906, 0089_PW314_220906, 0089_SW412_220906, 0089_PW411_220906, 0089_SW414_220906, 0089_PW413_220906, 0089_SW416_220906, 0089_PW415_220906	**06-Sep-2022**	**----**	----	----	**20-Sep-2022**	04-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW311_220906, 0089_PW308_220906, 0089_PW316_220906, 0089_SW309_220906, 0089_PW306_220906, 0089_PW307_220906, 0089_SW310_220906, 0089_PW315_220906, 0089_PW314_220906, 0089_SW412_220906, 0089_PW411_220906, 0089_SW414_220906, 0089_PW413_220906, 0089_SW416_220906, 0089_PW415_220906	**06-Sep-2022**	**----**	----	----	**12-Sep-2022**	13-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW311_220906, 0089_PW308_220906, 0089_PW316_220906, 0089_SW309_220906, 0089_PW306_220906, 0089_PW307_220906, 0089_SW310_220906, 0089_PW315_220906, 0089_PW314_220906, 0089_SW412_220906, 0089_PW411_220906, 0089_SW414_220906, 0089_PW413_220906, 0089_SW416_220906, 0089_PW415_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW311_220906, 0089_PW308_220906, 0089_PW316_220906, 0089_SW309_220906, 0089_PW306_220906, 0089_PW307_220906, 0089_SW310_220906, 0089_PW315_220906, 0089_PW314_220906, 0089_SW412_220906, 0089_PW411_220906, 0089_SW414_220906, 0089_PW413_220906, 0089_SW416_220906, 0089_PW415_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW311_220906, 0089_PW308_220906, 0089_PW316_220906, 0089_SW309_220906, 0089_PW306_220906, 0089_PW307_220906, 0089_SW310_220906, 0089_PW315_220906, 0089_PW314_220906, 0089_SW412_220906, 0089_PW411_220906, 0089_SW414_220906, 0089_PW413_220906, 0089_SW416_220906, 0089_PW415_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW311_220906, 0089_PW308_220906, 0089_PW316_220906, 0089_SW309_220906, 0089_PW306_220906, 0089_PW307_220906, 0089_SW310_220906, 0089_PW315_220906, 0089_PW314_220906, 0089_SW412_220906, 0089_PW411_220906, 0089_SW414_220906, 0089_PW413_220906, 0089_SW416_220906, 0089_PW415_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW311_220906, 0089_PW308_220906, 0089_PW316_220906, 0089_SW309_220906, 0089_PW306_220906, 0089_PW307_220906, 0089_SW310_220906, 0089_PW315_220906, 0089_PW314_220906, 0089_SW412_220906, 0089_PW411_220906, 0089_SW414_220906, 0089_PW413_220906, 0089_SW416_220906, 0089_PW415_220906	**06-Sep-2022**	**20-Sep-2022**	05-Mar-2023	✓	**20-Sep-2022**	05-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 42056 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD308		06/09/2022 10:57 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD314		06/09/2022 10:58 AM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD306		06/09/2022 10:58 AM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_SD316		06/09/2022 10:59 AM	Soil	ALS: 1 Non ALS: 0	No	X		
005	0089_SD307		06/09/2022 10:59 AM	Soil	ALS: 1 Non ALS: 0	No	X		
006	0089_SD315		06/09/2022 11:00 AM	Soil	ALS: 1 Non ALS: 0	No	X		
007	0089_SD413		06/09/2022 12:44 PM	Soil	ALS: 1 Non ALS: 0	No	X		
008	0089_SD411		06/09/2022 12:44 PM	Soil	ALS: 1 Non ALS: 0	No	X		
009	0089_SD415		06/09/2022 12:45 PM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **42056** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES TO

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD308	HDPE Soil Jar	200 mL	00620322012229	Grey	No	
002	0089_SD314	HDPE Soil Jar	200 mL	00620322012195	Grey	No	
003	0089_SD306	HDPE Soil Jar	200 mL	00620322012183	Grey	No	
004	0089_SD316	HDPE Soil Jar	200 mL	00620322012193	Grey	No	
005	0089_SD307	HDPE Soil Jar	200 mL	00620322012180	Grey	No	
006	0089_SD315	HDPE Soil Jar	200 mL	00620322012187	Grey	No	
007	0089_SD413	HDPE Soil Jar	200 mL	00620322012212	Grey	No	
008	0089_SD411	HDPE Soil Jar	200 mL	00620322012166	Grey	No	
009	0089_SD415	HDPE Soil Jar	200 mL	00620322012192	Grey	No	

Total Bottle Count: ALS: 9, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211402**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42056	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 06-Sep-2022 16:00	Issue Date	: 09-Sep-2022
Client Requested Due Date	: 21-Sep-2022	Scheduled Reporting Date	: **21-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 13.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2211402-001	06-Sep-2022 10:57	0089_SD308_220906	✓	✓
EP2211402-002	06-Sep-2022 10:58	0089_SD314_220906	✓	✓
EP2211402-003	06-Sep-2022 10:58	0089_SD306_220906	✓	✓
EP2211402-004	06-Sep-2022 10:59	0089_SD316_220906	✓	✓
EP2211402-005	06-Sep-2022 10:59	0089_SD307_220906	✓	✓
EP2211402-006	06-Sep-2022 11:00	0089_SD315_220906	✓	✓
EP2211402-007	06-Sep-2022 12:44	0089_SD413_220906	✓	✓
EP2211402-008	06-Sep-2022 12:44	0089_SD411_220906	✓	✓
EP2211402-009	06-Sep-2022 12:45	0089_SD415_220906	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) Email [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]stantec.com
- Chain of Custody (CoC) (COC) Email [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) Email [redacted]stantec.com
- EDI Format - XTab (XTAB) Email [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211402**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022 16:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Sep-2022
C-O-C number	: 42056	Issue Date	: 21-Sep-2022 14:42
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD308_220906	0089_SD314_220906	0089_SD306_220906	0089_SD316_220906	0089_SD307_220906
				Sampling date / time	06-Sep-2022 10:57	06-Sep-2022 10:58	06-Sep-2022 10:58	06-Sep-2022 10:59	06-Sep-2022 10:59
					EP2211402-001	EP2211402-002	EP2211402-003	EP2211402-004	EP2211402-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**20.3**	**6.4**	**22.8**	**19.2**	**21.1**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD308_220906	0089_SD314_220906	0089_SD306_220906	0089_SD316_220906	0089_SD307_220906
				Sampling date / time	06-Sep-2022 10:57	06-Sep-2022 10:58	06-Sep-2022 10:58	06-Sep-2022 10:59	06-Sep-2022 10:59
Compound	CAS Number	LOR	Unit		EP2211402-001	EP2211402-002	EP2211402-003	EP2211402-004	EP2211402-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**99.5**	**97.0**	**108**	**94.5**	**107**
13C8-PFOA	----	0.0002	%		**93.0**	**105**	**98.0**	**99.5**	**100**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD315_220906	0089_SD413_220906	0089_SD411_220906	0089_SD415_220906	----
			Sampling date / time	06-Sep-2022 11:00	06-Sep-2022 12:44	06-Sep-2022 12:44	06-Sep-2022 12:45	----
Compound	CAS Number	LOR	Unit	EP2211402-006	EP2211402-007	EP2211402-008	EP2211402-009	--------
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**8.7**	**28.9**	**14.3**	**29.0**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD315_220906	0089_SD413_220906	0089_SD411_220906	0089_SD415_220906	----
				Sampling date / time	06-Sep-2022 11:00	06-Sep-2022 12:44	06-Sep-2022 12:44	06-Sep-2022 12:45	----
Compound	CAS Number	LOR	Unit		EP2211402-006	EP2211402-007	EP2211402-008	EP2211402-009	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.5**	**95.0**	**96.0**	**107**	----
13C8-PFOA	----	0.0002	%		**102**	**95.5**	**99.5**	**102**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211402**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Sep-2022
C-O-C number	: 42056	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4592004)									
EP2211393-003	Anonymous	EA055: Moisture Content	----	0.1	%	19.3	19.3	0.0	0% - 20%
EP2211402-009	0089_SD415_220906	EA055: Moisture Content	----	0.1	%	29.0	29.6	2.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4586616)									
EP2211393-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0025	0.0023	8.5	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2211402-006	0089_SD315_220906	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4586616)									
EP2211393-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4586616) - continued									
EP2211393-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2211402-006	0089_SD315_220906	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4586616)									
EP2211393-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211402-006	0089_SD315_220906	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4586616)									
EP2211393-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2211402-006	0089_SD315_220906	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4586616)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4586616)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	89.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586616)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.5	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586616)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	78.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	96.8	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586616) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	85.2	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4586616)							
EP2211393-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	105	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	102	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	116	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	81.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	110	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4586616)							
EP2211393-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	94.5	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	114	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	129	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	108	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	116	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	120	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	112	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	123	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	117	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	99.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	117	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586616)							
EP2211393-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	97.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	118	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	112	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	116	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	116	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	123	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4586616) - continued							
EP2211393-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	124	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4586616)							
EP2211393-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	117	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	92.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	118	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	104	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211402**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 06-Sep-2022
Site	: Stirling SD - CG	Issue Date	: 21-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD308_220906, 0089_SD314_220906, 0089_SD306_220906, 0089_SD316_220906, 0089_SD307_220906, 0089_SD315_220906, 0089_SD413_220906, 0089_SD411_220906, 0089_SD415_220906	**06-Sep-2022**	**----**	----	----	**20-Sep-2022**	20-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD308_220906, 0089_SD314_220906, 0089_SD306_220906, 0089_SD316_220906, 0089_SD307_220906, 0089_SD315_220906, 0089_SD413_220906, 0089_SD411_220906, 0089_SD415_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD308_220906, 0089_SD314_220906, 0089_SD306_220906, 0089_SD316_220906, 0089_SD307_220906, 0089_SD315_220906, 0089_SD413_220906, 0089_SD411_220906, 0089_SD415_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD308_220906, 0089_SD314_220906, 0089_SD306_220906, 0089_SD316_220906, 0089_SD307_220906, 0089_SD315_220906, 0089_SD413_220906, 0089_SD411_220906, 0089_SD415_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD308_220906, 0089_SD314_220906, 0089_SD306_220906, 0089_SD316_220906, 0089_SD307_220906, 0089_SD315_220906, 0089_SD413_220906, 0089_SD411_220906, 0089_SD415_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD308_220906, 0089_SD314_220906, 0089_SD306_220906, 0089_SD316_220906, 0089_SD307_220906, 0089_SD315_220906, 0089_SD413_220906, 0089_SD411_220906, 0089_SD415_220906	**06-Sep-2022**	**19-Sep-2022**	05-Mar-2023	✓	**19-Sep-2022**	29-Oct-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: **42113** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 1700 7/9/22	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW228		07/09/2022 08:42 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 42113 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW228	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) *COC#:* **42113** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW228	Clear Plastic Bottle - Natural	500 mL	00070821039574	Green	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00350821012612	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00350821012648	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211495**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42113	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Sep-2022 17:00	Issue Date	: 14-Sep-2022
Client Requested Due Date	: 23-Sep-2022	Scheduled Reporting Date	: **23-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 20.5 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211495-001	07-Sep-2022 08:42	0089_MW228_220907	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211495**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42113	Issue Date	: 23-Sep-2022 14:02
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_220907	----	----	----	----
				Sampling date / time	07-Sep-2022 08:42	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211495-001	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**717**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**717**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**474**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2530**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**117**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**263**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**1520**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**93**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**95.6**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**96.0**	----	----	----	----
ø Ionic Balance	----	0.01	%		**0.22**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.08**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.06**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.12**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.7**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**2.90**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**3.03**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.94**	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_220907	----	----	----	----
				Sampling date / time	07-Sep-2022 08:42	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211495-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.10**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.24**	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_220907	----	----	----	----
				Sampling date / time	07-Sep-2022 08:42	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211495-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**8.17**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.12**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**8.11**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	----	----	----	----
13C8-PFOA	----	0.02	%		**100**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211495**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42113	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4588650)									
EP2211535-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	234	236	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	234	236	0.9	0% - 20%
EP2211439-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	420	429	2.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	420	429	2.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4577901)									
EP2211495-001	0089_MW228_220907	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	474	474	0.0	0% - 20%
EP2211675-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	26	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4577899)									
EP2211495-001	0089_MW228_220907	ED045G: Chloride	16887-00-6	1	mg/L	2530	2560	1.4	0% - 20%
EP2211675-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	5	5	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4577338)									
EP2211495-001	0089_MW228_220907	ED093F: Calcium	7440-70-2	1	mg/L	117	117	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	263	262	0.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1520	1510	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	93	94	1.3	0% - 20%
EP2211496-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	435	430	1.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1420	1400	1.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11100	11000	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	502	497	1.1	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4590286) - continued									
EP2211498-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4588650)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	87.8	118
				<1	200 mg/L	97.2	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4577901)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	100	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4577899)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	104	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4577338)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.9	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.8	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4590286)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	92.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	114	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	94.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4590286)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4590286) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	119	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4590286)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	99.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	114	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	120	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4590286)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	125	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	92.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4577901)							
EP2211495-001	0089_MW228_220907	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4577899)							
EP2211495-001	0089_MW228_220907	ED045G: Chloride	16887-00-6	1000 mg/L	86.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	89.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	104	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	108	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	89.6	65.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4590286) - continued							
EP2211611-001	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	90.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	95.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	96.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	91.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	91.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	95.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	101	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	109	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	96.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	111	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	97.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	120	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	88.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211495**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Site	: Stirling GW - CG	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 1
Order number	: pfas-omp/Stirling	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211495--001	0089_MW228_220907	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	15	6.67	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW228_220907	**07-Sep-2022**	**----**	----	----	**19-Sep-2022**	21-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW228_220907	**07-Sep-2022**	**----**	----	----	**19-Sep-2022**	05-Oct-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW228_220907	**07-Sep-2022**	**----**	----	----	**19-Sep-2022**	05-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW228_220907	**07-Sep-2022**	**----**	----	----	**13-Sep-2022**	14-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW228_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0089_MW228_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_MW228_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW228_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_MW228_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 42114 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 1700 7/9/22	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW406		07/09/2022 08:56 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
002	0089_PW405		07/09/2022 08:57 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0089_PW350		07/09/2022 09:13 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0089_SW353		07/09/2022 09:20 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0089_SW384		07/09/2022 09:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0089_PW401		07/09/2022 09:23 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0089_SW383		07/09/2022 09:25 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0089_PW380		07/09/2022 09:26 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0089_PW351		07/09/2022 09:27 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

COC#: 42114 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0089_SW382		07/09/2022 09:28 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
011	0089_PW381		07/09/2022 09:30 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		
012	0089_PW352		07/09/2022 09:32 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 42114 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW406	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW405	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_PW350	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_SW353	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0089_SW384	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0089_PW401	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0089_SW383	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0089_PW380	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0089_PW351	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **42114** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

010	0089_SW382	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0089_PW381	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0089_PW352	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 42114 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW406	Clear Plastic Bottle - Natural	500 mL	00070821039513	Green	No	
001	0089_SW406	HDPE (no PTFE)	20 mL	00350821012616	Grey	No	
001	0089_SW406	HDPE (no PTFE)	20 mL	00350821012642	Grey	No	
002	0089_PW405	Clear Plastic Bottle - Natural	500 mL	00070821057238	Green	No	
002	0089_PW405	HDPE (no PTFE)	20 mL	00350821012716	Grey	No	
002	0089_PW405	HDPE (no PTFE)	20 mL	00350821012737	Grey	No	
003	0089_PW350	Clear Plastic Bottle - Natural	500 mL	00070821039457	Green	No	
003	0089_PW350	HDPE (no PTFE)	20 mL	00350821012569	Grey	No	
003	0089_PW350	HDPE (no PTFE)	20 mL	00350821012650	Grey	No	
004	0089_SW353	Clear Plastic Bottle - Natural	500 mL	00070821057211	Green	No	
004	0089_SW353	HDPE (no PTFE)	20 mL	00350821012726	Grey	No	
004	0089_SW353	HDPE (no PTFE)	20 mL	00350821012522	Grey	No	
005	0089_SW384	Clear Plastic Bottle - Natural	500 mL	00070821057208	Green	No	
005	0089_SW384	HDPE (no PTFE)	20 mL	00350821012589	Grey	No	
005	0089_SW384	HDPE (no PTFE)	20 mL	00350821012719	Grey	No	
006	0089_PW401	Clear Plastic Bottle - Natural	500 mL	00070821039500	Green	No	
006	0089_PW401	HDPE (no PTFE)	20 mL	00350821012564	Grey	No	
006	0089_PW401	HDPE (no PTFE)	20 mL	00350821012736	Grey	No	
007	0089_SW383	Clear Plastic Bottle - Natural	500 mL	00070821039448	Green	No	
007	0089_SW383	HDPE (no PTFE)	20 mL	00350821012896	Grey	No	
007	0089_SW383	HDPE (no PTFE)	20 mL	00350821012869	Grey	No	
008	0089_PW380	Clear Plastic Bottle - Natural	500 mL	00070821039479	Green	No	
008	0089_PW380	HDPE (no PTFE)	20 mL	00350821012588	Grey	No	
008	0089_PW380	HDPE (no PTFE)	20 mL	00350821012523	Grey	No	
009	0089_PW351	Clear Plastic Bottle - Natural	500 mL	00070821039480	Green	No	
009	0089_PW351	HDPE (no PTFE)	20 mL	00350821012969	Grey	No	

Wednesday, September 7, 2022 11:48:54 AM

CHAIN OF CUSTODY

COC#: 42114 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

009	0089_PW351	HDPE (no PTFE)	20 mL	00350821012619	Grey	No	
010	0089_SW382	Clear Plastic Bottle - Natural	500 mL	00070821057243	Green	No	
010	0089_SW382	HDPE (no PTFE)	20 mL	00350821012951	Grey	No	
010	0089_SW382	HDPE (no PTFE)	20 mL	00350821012837	Grey	No	
011	0089_PW381	Clear Plastic Bottle - Natural	500 mL	00070821039553	Green	No	
011	0089_PW381	HDPE (no PTFE)	20 mL	00350821012953	Grey	No	
011	0089_PW381	HDPE (no PTFE)	20 mL	00350821012924	Grey	No	
012	0089_PW352	Clear Plastic Bottle - Natural	500 mL	00070821039543	Green	No	
012	0089_PW352	HDPE (no PTFE)	20 mL	00350821013042	Grey	No	
012	0089_PW352	HDPE (no PTFE)	20 mL	00350821012856	Grey	No	

Total Bottle Count: ALS: 36, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211496**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42114	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 07-Sep-2022 17:00	Issue Date	: 14-Sep-2022
Client Requested Due Date	: 23-Sep-2022	Scheduled Reporting Date	: **23-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 20.5 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211496-001	07-Sep-2022 08:56	0089_SW406_220907	✓	✓	✓	✓
EP2211496-002	07-Sep-2022 08:57	0089_PW405_220907	✓	✓	✓	✓
EP2211496-003	07-Sep-2022 09:13	0089_PW350_220907	✓	✓	✓	✓
EP2211496-004	07-Sep-2022 09:20	0089_SW353_220907	✓	✓	✓	✓
EP2211496-005	07-Sep-2022 09:21	0089_SW384_220907	✓	✓	✓	✓
EP2211496-006	07-Sep-2022 09:23	0089_PW401_220907	✓	✓	✓	✓
EP2211496-007	07-Sep-2022 09:25	0089_SW383_220907	✓	✓	✓	✓
EP2211496-008	07-Sep-2022 09:26	0089_PW380_220907	✓	✓	✓	✓
EP2211496-009	07-Sep-2022 09:27	0089_PW351_220907	✓	✓	✓	✓
EP2211496-010	07-Sep-2022 09:28	0089_SW382_220907	✓	✓	✓	✓
EP2211496-011	07-Sep-2022 09:30	0089_PW381_220907	✓	✓	✓	✓
EP2211496-012	07-Sep-2022 09:32	0089_PW352_220907	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) Email [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]stantec.com
- Chain of Custody (CoC) (COC) Email [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) Email [redacted]stantec.com
- EDI Format - XTab (XTAB) Email [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211496**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42114	Issue Date	: 23-Sep-2022 22:05
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Positive result for various analytes on samples EP2211496_003,008 has been confirmed by re-extraction and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW406_220907	0089_PW405_220907	0089_PW350_220907	0089_SW353_220907	0089_SW384_220907
				Sampling date / time	07-Sep-2022 08:56	07-Sep-2022 08:57	07-Sep-2022 09:13	07-Sep-2022 09:20	07-Sep-2022 09:21
Compound	CAS Number	LOR	Unit		EP2211496-001	EP2211496-002	EP2211496-003	EP2211496-004	EP2211496-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		120	117	119	120	122
Total Alkalinity as CaCO3	----	1	mg/L		120	117	119	120	122
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2480	2400	2410	2430	2420
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16700	16400	16700	16600	16800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		423	434	438	442	433
Magnesium	7439-95-4	1	mg/L		1370	1400	1420	1430	1410
Sodium	7440-23-5	1	mg/L		10700	10900	11100	11100	11000
Potassium	7440-09-7	1	mg/L		485	487	495	500	493
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		525	515	524	521	527
ø Total Cations	----	0.01	meq/L		612	623	634	635	629
ø Ionic Balance	----	0.01	%		7.62	9.53	9.55	9.86	8.83
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW406_220907	0089_PW405_220907	0089_PW350_220907	0089_SW353_220907	0089_SW384_220907
			Sampling date / time	07-Sep-2022 08:56	07-Sep-2022 08:57	07-Sep-2022 09:13	07-Sep-2022 09:20	07-Sep-2022 09:21
Compound	CAS Number	LOR	Unit	EP2211496-001	EP2211496-002	EP2211496-003	EP2211496-004	EP2211496-005
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW406_220907	0089_PW405_220907	0089_PW350_220907	0089_SW353_220907	0089_SW384_220907
				Sampling date / time	07-Sep-2022 08:56	07-Sep-2022 08:57	07-Sep-2022 09:13	07-Sep-2022 09:20	07-Sep-2022 09:21
Compound	CAS Number	LOR	Unit		EP2211496-001	EP2211496-002	EP2211496-003	EP2211496-004	EP2211496-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**0.01**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.01**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.01**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**115**	**98.1**	**108**	**101**
13C8-PFOA	----	0.02	%		**101**	**100**	**93.1**	**101**	**95.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW401_220907	0089_SW383_220907	0089_PW380_220907	0089_PW351_220907	0089_SW382_220907
				Sampling date / time	07-Sep-2022 09:23	07-Sep-2022 09:25	07-Sep-2022 09:26	07-Sep-2022 09:27	07-Sep-2022 09:28
Compound	CAS Number	LOR	Unit		EP2211496-006	EP2211496-007	EP2211496-008	EP2211496-009	EP2211496-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		119	118	115	120	119
Total Alkalinity as CaCO3	----	1	mg/L		119	118	115	120	119
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2510	2500	2470	2480	2490
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16600	16500	16600	16500	16900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		429	437	426	438	435
Magnesium	7439-95-4	1	mg/L		1400	1420	1380	1410	1420
Sodium	7440-23-5	1	mg/L		11000	11000	10700	10900	11100
Potassium	7440-09-7	1	mg/L		492	501	484	501	502
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		523	520	522	519	531
ø Total Cations	----	0.01	meq/L		628	630	613	625	634
ø Ionic Balance	----	0.01	%		9.11	9.58	7.99	9.21	8.86
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	0.05	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW401_220907	0089_SW383_220907	0089_PW380_220907	0089_PW351_220907	0089_SW382_220907
				Sampling date / time	07-Sep-2022 09:23	07-Sep-2022 09:25	07-Sep-2022 09:26	07-Sep-2022 09:27	07-Sep-2022 09:28
Compound	CAS Number	LOR	Unit		EP2211496-006	EP2211496-007	EP2211496-008	EP2211496-009	EP2211496-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW401_220907	0089_SW383_220907	0089_PW380_220907	0089_PW351_220907	0089_SW382_220907
				Sampling date / time	07-Sep-2022 09:23	07-Sep-2022 09:25	07-Sep-2022 09:26	07-Sep-2022 09:27	07-Sep-2022 09:28
Compound	CAS Number	LOR	Unit		EP2211496-006	EP2211496-007	EP2211496-008	EP2211496-009	EP2211496-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**0.06**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.06**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.06**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**102**	**103**	**102**	**104**
13C8-PFOA	----	0.02	%		**99.9**	**98.4**	**101**	**96.1**	**95.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_220907	0089_PW352_220907	----	----	----
				Sampling date / time	07-Sep-2022 09:30	07-Sep-2022 09:32	----	----	----
Compound	CAS Number	LOR	Unit		EP2211496-011	EP2211496-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**120**	**124**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**120**	**124**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2450**	**2490**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**16700**	**16600**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**421**	**431**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1380**	**1380**	----	----	----
Sodium	7440-23-5	1	mg/L		**10700**	**10800**	----	----	----
Potassium	7440-09-7	1	mg/L		**487**	**482**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**524**	**522**	----	----	----
ø Total Cations	----	0.01	meq/L		**612**	**617**	----	----	----
ø Ionic Balance	----	0.01	%		**7.74**	**8.30**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_220907	0089_PW352_220907	----	----	----
				Sampling date / time	07-Sep-2022 09:30	07-Sep-2022 09:32	----	----	----
Compound	CAS Number	LOR	Unit		EP2211496-011	EP2211496-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW381_220907	0089_PW352_220907	----	----	----
			Sampling date / time	07-Sep-2022 09:30	07-Sep-2022 09:32	----	----	----
Compound	CAS Number	LOR	Unit	EP2211496-011	EP2211496-012	--------	--------	--------
				Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**107**	**96.4**	----	----	----
13C8-PFOA	----	0.02	%	**98.0**	**101**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211496**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42114	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Inorganics Supervisor	Perth Inorganics, Wangara, Western Australia
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4590821)									
EP2211496-002	0089_PW405_220907	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	117	117	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	117	117	0.0	0% - 20%
EP2211705-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	163	162	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	163	162	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4583264)									
EP2211496-001	0089_SW406_220907	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2480	2490	0.3	0% - 20%
EP2211496-011	0089_PW381_220907	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2450	2480	1.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4583263)									
EP2211496-001	0089_SW406_220907	ED045G: Chloride	16887-00-6	1	mg/L	16700	16700	0.3	0% - 20%
EP2211496-011	0089_PW381_220907	ED045G: Chloride	16887-00-6	1	mg/L	16700	16800	0.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4577338)									
EP2211495-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	117	117	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	263	262	0.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1520	1510	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	93	94	1.3	0% - 20%
EP2211496-010	0089_SW382_220907	ED093F: Calcium	7440-70-2	1	mg/L	435	430	1.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1420	1400	1.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11100	11000	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	502	497	1.1	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4590286) - continued									
EP2211498-001	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4590286)									
EP2211498-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4590821)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	104	87.8	118
				<1	200 mg/L	94.2	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4583264)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.8	89.9	112
				<1	500 mg/L	95.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4583263)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.6	88.6	113
				<1	1000 mg/L	93.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4577338)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.9	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.8	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4590286)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	92.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	114	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	94.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4590286)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4590286) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	119	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4590286)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	99.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	114	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	120	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4590286)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	125	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	92.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4583264)							
EP2211496-001	0089_SW406_220907	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4583263)							
EP2211496-001	0089_SW406_220907	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	89.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	104	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	108	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	91.6	69.0	134

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4590286) - continued							
EP2211611-001	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	89.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	90.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	95.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	96.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	91.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	91.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	95.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	101	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	109	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	96.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	111	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	97.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	120	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	88.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211496**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Site	: Stirling SW/PW - CG	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211496--001	0089_SW406_220907	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2211496--001	0089_SW406_220907	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	15	6.67	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW406_220907, 0089_PW405_220907, 0089_PW350_220907, 0089_SW353_220907, 0089_SW384_220907, 0089_PW401_220907, 0089_SW383_220907, 0089_PW380_220907, 0089_PW351_220907, 0089_SW382_220907, 0089_PW381_220907, 0089_PW352_220907	**07-Sep-2022**	**----**	----	----	**20-Sep-2022**	21-Sep-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW406_220907, 0089_PW405_220907, 0089_PW350_220907, 0089_SW353_220907, 0089_SW384_220907, 0089_PW401_220907, 0089_SW383_220907, 0089_PW380_220907, 0089_PW351_220907, 0089_SW382_220907, 0089_PW381_220907, 0089_PW352_220907	**07-Sep-2022**	**----**	----	----	**23-Sep-2022**	05-Oct-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW406_220907, 0089_PW405_220907, 0089_PW350_220907, 0089_SW353_220907, 0089_SW384_220907, 0089_PW401_220907, 0089_SW383_220907, 0089_PW380_220907, 0089_PW351_220907, 0089_SW382_220907, 0089_PW381_220907, 0089_PW352_220907	**07-Sep-2022**	**----**	----	----	**23-Sep-2022**	05-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW406_220907, 0089_PW405_220907, 0089_PW350_220907, 0089_SW353_220907, 0089_SW384_220907, 0089_PW401_220907, 0089_SW383_220907, 0089_PW380_220907, 0089_PW351_220907, 0089_SW382_220907, 0089_PW381_220907, 0089_PW352_220907	**07-Sep-2022**	**----**	----	----	**13-Sep-2022**	14-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW406_220907, 0089_PW405_220907, 0089_PW350_220907, 0089_SW353_220907, 0089_SW384_220907, 0089_PW401_220907, 0089_SW383_220907, 0089_PW380_220907, 0089_PW351_220907, 0089_SW382_220907, 0089_PW381_220907, 0089_PW352_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW406_220907, 0089_PW405_220907, 0089_PW350_220907, 0089_SW353_220907, 0089_SW384_220907, 0089_PW401_220907, 0089_SW383_220907, 0089_PW380_220907, 0089_PW351_220907, 0089_SW382_220907, 0089_PW381_220907, 0089_PW352_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW406_220907, 0089_PW405_220907, 0089_PW350_220907, 0089_SW353_220907, 0089_SW384_220907, 0089_PW401_220907, 0089_SW383_220907, 0089_PW380_220907, 0089_PW351_220907, 0089_SW382_220907, 0089_PW381_220907, 0089_PW352_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW406_220907, 0089_PW405_220907, 0089_PW350_220907, 0089_SW353_220907, 0089_SW384_220907, 0089_PW401_220907, 0089_SW383_220907, 0089_PW380_220907, 0089_PW351_220907, 0089_SW382_220907, 0089_PW381_220907, 0089_PW352_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW406_220907, 0089_PW405_220907, 0089_PW350_220907, 0089_SW353_220907, 0089_SW384_220907, 0089_PW401_220907, 0089_SW383_220907, 0089_PW380_220907, 0089_PW351_220907, 0089_SW382_220907, 0089_PW381_220907, 0089_PW352_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: **42115** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: 0448308372 SAMPLER MOBILE:
QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 1700 7/9/22	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD405		07/09/2022 08:58 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD350		07/09/2022 09:13 AM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 42115 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD405	HDPE Soil Jar	200 mL	00620322012172	Grey	No	
002	0089_SD350	HDPE Soil Jar	200 mL	00620322012215	Grey	No	

Total Bottle Count: ALS: 2, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211497**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42115	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Sep-2022 17:00	Issue Date	: 13-Sep-2022
Client Requested Due Date	: 22-Sep-2022	Scheduled Reporting Date	: **22-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 20.5 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2211497-001	07-Sep-2022 08:58	0089_SD405_220907	✓	✓
EP2211497-002	07-Sep-2022 09:13	0089_SD350_220907	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211497**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Sep-2022
C-O-C number	: 42115	Issue Date	: 23-Sep-2022 13:02
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD405_220907	0089_SD350_220907	----	----	----
			Sampling date / time	07-Sep-2022 08:58	07-Sep-2022 09:13	----	----	----
Compound	CAS Number	LOR	Unit	EP2211497-001	EP2211497-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**27.7**	**18.7**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_220907	0089_SD350_220907	----	----	----
				Sampling date / time	07-Sep-2022 08:58	07-Sep-2022 09:13	----	----	----
Compound	CAS Number	LOR	Unit		EP2211497-001	EP2211497-002	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**99.0**	**95.0**	----	----	----
13C8-PFOA	----	0.0002	%		**100**	**103**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211497**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Sep-2022
C-O-C number	: 42115	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4592094)									
EP2211499-001	Anonymous	EA055: Moisture Content	----	0.1	%	29.9	29.2	2.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4587400)									
EP2211497-001	0089_SD405_220907	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2232719-010	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4587400)									
EP2211497-001	0089_SD405_220907	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4587400) - continued									
EP2211497-001	0089_SD405_220907	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2232719-010	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4587400)									
EP2211497-001	0089_SD405_220907	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2232719-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4587400)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4587400) - continued									
EP2211497-001	0089_SD405_220907	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2232719-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4587400)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4587400)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4587400)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	120	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4587400)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	125	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	115	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	97.6	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4587400) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	78.4	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4587400)							
EP2211497-001	0089_SD405_220907	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	102	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	92.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	92.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	89.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	90.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	92.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4587400)							
EP2211497-001	0089_SD405_220907	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	117	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	98.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	93.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	94.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	101	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	98.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	95.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	102	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	101	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	114	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4587400)							
EP2211497-001	0089_SD405_220907	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	83.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	99.5	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	97.6	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	91.0	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	96.6	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	104	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4587400) - continued							
EP2211497-001	0089_SD405_220907	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	88.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4587400)							
EP2211497-001	0089_SD405_220907	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	102	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	101	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	80.8	69.2	143

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211497**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Site	: Stirling SD - CG	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 2
Order number	: pfas-omp/Stirling	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD405_220907,	0089_SD350_220907	**07-Sep-2022**	**----**	----	----	**20-Sep-2022**	21-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD405_220907,	0089_SD350_220907	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD405_220907,	0089_SD350_220907	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD405_220907,	0089_SD350_220907	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD405_220907,	0089_SD350_220907	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD405_220907,	0089_SD350_220907	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: **42118** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY: [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 1700 7/9/22	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW408		07/09/2022 08:41 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0089_PW407		07/09/2022 09:21 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

(ALS) COC#: **42118** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]
PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_SW408	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_PW407	Surface Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: **42118** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SW408	HDPE (no PTFE)	20 mL	00350821012814	Grey	No	
001	0089_SW408	HDPE (no PTFE)	20 mL	00350821013021	Grey	No	
001	0089_SW408	HDPE (no PTFE)	20 mL	00352101057644	Grey	No	
001	0089_SW408	HDPE (no PTFE)	20 mL	00352101038349	Grey	No	
001	0089_SW408	Clear Plastic Bottle - Natural	500 mL	00070821039541	Green	No	
002	0089_PW407	Clear Plastic Bottle - Natural	500 mL	00070821057218	Green	No	
002	0089_PW407	HDPE (no PTFE)	20 mL	00350821012972	Grey	No	
002	0089_PW407	HDPE (no PTFE)	20 mL	00350821012829	Grey	No	

Total Bottle Count: ALS: 8, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211498**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42118	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Sep-2022 17:00	Issue Date	: 14-Sep-2022
Client Requested Due Date	: 23-Sep-2022	Scheduled Reporting Date	: **23-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 20.5 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211498-001	07-Sep-2022 08:41	0089_SW408_220907	✓	✓	✓	✓
EP2211498-002	07-Sep-2022 09:21	0089_PW407_220907	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) Email [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email [redacted]stantec.com
- Chain of Custody (CoC) (COC) Email [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) Email [redacted]stantec.com
- EDI Format - XTab (XTAB) Email [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211498**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42118	Issue Date	: 23-Sep-2022 14:02
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW408_220907	0089_PW407_220907	----	----	----
			Sampling date / time	07-Sep-2022 08:41	07-Sep-2022 09:21	----	----	----
Compound	CAS Number	LOR	Unit	EP2211498-001	EP2211498-002	--------	--------	--------
				Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**122**	**123**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**122**	**123**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2530**	**2520**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**18000**	**17700**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**416**	**420**	----	----	----
Magnesium	7439-95-4	1	mg/L	**1350**	**1360**	----	----	----
Sodium	7440-23-5	1	mg/L	**10500**	**10600**	----	----	----
Potassium	7440-09-7	1	mg/L	**473**	**481**	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**563**	**554**	----	----	----
ø Total Cations	----	0.01	meq/L	**601**	**606**	----	----	----
ø Ionic Balance	----	0.01	%	**3.25**	**4.48**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW408_220907	0089_PW407_220907	----	----	----
				Sampling date / time	07-Sep-2022 08:41	07-Sep-2022 09:21	----	----	----
Compound	CAS Number	LOR	Unit		EP2211498-001	EP2211498-002	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW408_220907	0089_PW407_220907	----	----	----
			Sampling date / time	07-Sep-2022 08:41	07-Sep-2022 09:21	----	----	----
Compound	CAS Number	LOR	Unit	EP2211498-001	EP2211498-002	--------	--------	--------
				Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**96.3**	**99.4**	----	----	----
13C8-PFOA	----	0.02	%	**96.4**	**105**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211498**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42118	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4588650)									
EP2211535-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	234	236	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	234	236	0.9	0% - 20%
EP2211439-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	420	429	2.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	420	429	2.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4577901)									
EP2211495-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	474	474	0.0	0% - 20%
EP2211675-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	26	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4577899)									
EP2211495-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2530	2560	1.4	0% - 20%
EP2211675-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	5	5	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4577338)									
EP2211495-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	117	117	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	263	262	0.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1520	1510	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	93	94	1.3	0% - 20%
EP2211496-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	435	430	1.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1420	1400	1.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11100	11000	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	502	497	1.1	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4590286)									
EP2211498-001	0089_SW408_220907	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4590286)									
EP2211498-001	0089_SW408_220907	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4590286)									
EP2211498-001	0089_SW408_220907	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4590286)									
EP2211498-001	0089_SW408_220907	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4590286) - continued									
EP2211498-001	0089_SW408_220907	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4590286)									
EP2211498-001	0089_SW408_220907	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4588650)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	87.8	118
				<1	200 mg/L	97.2	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4577901)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	100	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4577899)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	104	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4577338)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.9	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.8	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4590286)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	92.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	114	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	94.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4590286)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4590286) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	119	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4590286)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	99.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	114	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	120	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4590286)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	125	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	92.2	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4577901)							
EP2211495-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4577899)							
EP2211495-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	86.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	89.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	104	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	108	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	89.6	65.0	140

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4590286) - continued							
EP2211611-001	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	90.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	95.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	96.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	91.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	91.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	95.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	101	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	109	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	96.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4590286)							
EP2211611-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	111	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	97.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	120	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	88.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211498**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Site	: Stirling SW/PW - JS	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 2
Order number	: pfas-omp/Stirling	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211495--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	15	6.67	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW408_220907,	0089_PW407_220907	**07-Sep-2022**	**----**	----	----	**19-Sep-2022**	21-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW408_220907,	0089_PW407_220907	**07-Sep-2022**	**----**	----	----	**19-Sep-2022**	05-Oct-2022	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW408_220907,	0089_PW407_220907	**07-Sep-2022**	**----**	----	----	**19-Sep-2022**	05-Oct-2022	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW408_220907,	0089_PW407_220907	**07-Sep-2022**	**----**	----	----	**13-Sep-2022**	14-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW408_220907,	0089_PW407_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW408_220907,	0089_PW407_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_SW408_220907,	0089_PW407_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW408_220907,	0089_PW407_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_SW408_220907,	0089_PW407_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

COC#: 42124 *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 1700 7/9/22	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD407		07/09/2022 09:22 AM	Soil	ALS: 1 Non ALS: 0	No	X		
002	0089_SD401		07/09/2022 09:25 AM	Soil	ALS: 1 Non ALS: 0	No	X		
003	0089_SD380		07/09/2022 09:26 AM	Soil	ALS: 1 Non ALS: 0	No	X		
004	0089_SD351		07/09/2022 09:28 AM	Soil	ALS: 1 Non ALS: 0	No	X		
005	0089_SD381		07/09/2022 09:29 AM	Soil	ALS: 1 Non ALS: 0	No	X		
006	0089_SD352		07/09/2022 09:29 AM	Soil	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **42124** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_SD407	HDPE Soil Jar	200 mL	00620322012184	Grey	No	
002	0089_SD401	HDPE Soil Jar	200 mL	00620322012244	Grey	No	
003	0089_SD380	HDPE Soil Jar	200 mL	00620322012222	Grey	No	
004	0089_SD351	HDPE Soil Jar	200 mL	00620322012275	Grey	No	
005	0089_SD381	HDPE Soil Jar	200 mL	00620322012168	Grey	No	
006	0089_SD352	HDPE Soil Jar	200 mL	00620322012185	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211499**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42124	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Sep-2022 17:00	Issue Date	: 13-Sep-2022
Client Requested Due Date	: 22-Sep-2022	Scheduled Reporting Date	: **22-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 20.5 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2211499-001	07-Sep-2022 09:22	0089_SD407_220907	✓	✓
EP2211499-002	07-Sep-2022 09:25	0089_SD401_220907	✓	✓
EP2211499-003	07-Sep-2022 09:26	0089_SD380_220907	✓	✓
EP2211499-004	07-Sep-2022 09:28	0089_SD351_220907	✓	✓
EP2211499-005	07-Sep-2022 09:29	0089_SD381_220907	✓	✓
EP2211499-006	07-Sep-2022 09:29	0089_SD352_220907	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211499**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Sep-2022
C-O-C number	: 42124	Issue Date	: 23-Sep-2022 12:44
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0089_SD407_220907	0089_SD401_220907	0089_SD380_220907	0089_SD351_220907	0089_SD381_220907
				Sampling date / time	07-Sep-2022 09:22	07-Sep-2022 09:25	07-Sep-2022 09:26	07-Sep-2022 09:28	07-Sep-2022 09:29
					EP2211499-001	EP2211499-002	EP2211499-003	EP2211499-004	EP2211499-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**29.9**	**23.8**	**22.9**	**23.0**	**22.6**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD407_220907	0089_SD401_220907	0089_SD380_220907	0089_SD351_220907	0089_SD381_220907
				Sampling date / time	07-Sep-2022 09:22	07-Sep-2022 09:25	07-Sep-2022 09:26	07-Sep-2022 09:28	07-Sep-2022 09:29
Compound	CAS Number	LOR	Unit		EP2211499-001	EP2211499-002	EP2211499-003	EP2211499-004	EP2211499-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.0**	**91.5**	**89.5**	**81.5**	**89.5**
13C8-PFOA	----	0.0002	%		**108**	**97.5**	**94.5**	**102**	**93.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD352_220907	----	----	----	----
				Sampling date / time	07-Sep-2022 09:29	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211499-006	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**20.5**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD352_220907	----	----	----	----
				Sampling date / time	07-Sep-2022 09:29	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211499-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**96.0**	----	----	----	----
13C8-PFOA	----	0.0002	%		**102**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211499**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 20-Sep-2022
C-O-C number	: 42124	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Inorganics, Smithfield, NSW
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4592094)									
EP2211499-001	0089_SD407_220907	EA055: Moisture Content	----	0.1	%	29.9	29.2	2.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4587400)									
EP2211497-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2232719-010	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4587400)									
EP2211497-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4587400) - continued									
EP2211497-001	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2232719-010	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4587400)									
EP2211497-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2232719-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4587400)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4587400) - continued									
EP2211497-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2232719-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4587400)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4587400)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	124	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4587400)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	120	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4587400)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	125	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	115	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	97.6	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4587400) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	78.4	69.2	143

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4587400)							
EP2211497-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	102	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	92.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	92.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	89.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	90.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	92.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4587400)							
EP2211497-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	117	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	98.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	93.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	94.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	101	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	98.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	95.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	102	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	101	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	114	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4587400)							
EP2211497-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	83.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	99.5	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	97.6	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	91.0	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	96.6	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	104	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4587400) - continued							
EP2211497-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	88.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4587400)							
EP2211497-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	102	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	101	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	80.8	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211499**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Site	: Stirling SD - JS	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD407_220907,	0089_SD401_220907,	**07-Sep-2022**	**----**	----	----	**20-Sep-2022**	21-Sep-2022	✓
0089_SD380_220907,	0089_SD351_220907,							
0089_SD381_220907,	0089_SD352_220907							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD407_220907,	0089_SD401_220907,	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓
0089_SD380_220907,	0089_SD351_220907,							
0089_SD381_220907,	0089_SD352_220907							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD407_220907,	0089_SD401_220907,	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓
0089_SD380_220907,	0089_SD351_220907,							
0089_SD381_220907,	0089_SD352_220907							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD407_220907,	0089_SD401_220907,	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓
0089_SD380_220907,	0089_SD351_220907,							
0089_SD381_220907,	0089_SD352_220907							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD407_220907,	0089_SD401_220907,	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓
0089_SD380_220907,	0089_SD351_220907,							
0089_SD381_220907,	0089_SD352_220907							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD407_220907,	0089_SD401_220907,	**07-Sep-2022**	**20-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	30-Oct-2022	✓
0089_SD380_220907,	0089_SD351_220907,							
0089_SD381_220907,	0089_SD352_220907							

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS COC#: 42171 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW217		08/09/2022 08:05 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			
002	0089_MW220		08/09/2022 08:13 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			
003	0089_MW224		08/09/2022 08:14 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			
004	0089_MW282		08/09/2022 08:16 AM	Water	ALS: 3 Non ALS: 0	No	Partial 4/8			
005	0089_QC301		08/09/2022 09:30 AM	Water	ALS: 2 Non ALS: 0	No		X		
006	0089_QC401		08/09/2022 09:31 AM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 42171 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW217	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0089_MW220	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0089_MW224	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0089_MW282	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 42171 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW217	HDPE (no PTFE)	20 mL	00350821012887	Grey	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00350821012788	Grey	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00352101057637	Grey	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00352101038389	Grey	No	
001	0089_MW217	Clear Plastic Bottle - Natural	500 mL	00070821041335	Green	No	
002	0089_MW220	Clear Plastic Bottle - Natural	500 mL	00070821057253	Green	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00350821012922	Grey	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00350821012805	Grey	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00352101038326	Grey	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00352101038233	Grey	No	
003	0089_MW224	Clear Plastic Bottle - Natural	500 mL	00070821057224	Green	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00350821013032	Grey	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00350821012963	Grey	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00352101057623	Grey	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00352101057703	Grey	No	
004	0089_MW282	HDPE (no PTFE)	20 mL	00350821012890	Grey	No	
004	0089_MW282	Clear Plastic Bottle - Natural	500 mL	00070821039521	Green	No	
004	0089_MW282	HDPE (no PTFE)	20 mL	00350821013053	Grey	No	
005	0089_QC301	HDPE (no PTFE)	20 mL	00352101038190	Grey	No	
005	0089_QC301	HDPE (no PTFE)	20 mL	00352101038074	Grey	No	
006	0089_QC401	HDPE (no PTFE)	20 mL	00352101057675	Grey	No	
006	0089_QC401	HDPE (no PTFE)	20 mL	00352101038320	Grey	No	

Total Bottle Count: ALS: 22, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2211535**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42171	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 09-Sep-2022 14:00	Issue Date	: 09-Sep-2022
Client Requested Due Date	: 21-Sep-2022	Scheduled Reporting Date	: **21-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 4.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211535-001	08-Sep-2022 08:05	0089_MW217_220908	✓	✓	✓	✓
EP2211535-002	08-Sep-2022 08:13	0089_MW220_220908	✓	✓	✓	✓
EP2211535-003	08-Sep-2022 08:14	0089_MW224_220908	✓	✓	✓	✓
EP2211535-004	08-Sep-2022 08:16	0089_MW282_220908	✓	✓	✓	✓
EP2211535-005	08-Sep-2022 09:30	0089_QC301_220908		✓		
EP2211535-006	08-Sep-2022 09:31	0089_QC401_220908		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211535**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Sep-2022 14:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42171	Issue Date	: 23-Sep-2022 12:44
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_220908	0089_MW220_220908	0089_MW224_220908	0089_MW282_220908	0089_QC301_220908
				Sampling date / time	08-Sep-2022 08:05	08-Sep-2022 08:13	08-Sep-2022 08:14	08-Sep-2022 08:16	08-Sep-2022 09:30
Compound	CAS Number	LOR	Unit		EP2211535-001	EP2211535-002	EP2211535-003	EP2211535-004	EP2211535-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		296	352	234	445	----
Total Alkalinity as CaCO3	----	1	mg/L		296	352	234	445	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		60	38	40	13	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		50	50	110	17	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		118	114	58	137	----
Magnesium	7439-95-4	1	mg/L		14	18	21	16	----
Sodium	7440-23-5	1	mg/L		54	44	86	18	----
Potassium	7440-09-7	1	mg/L		11	12	4	<1	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		8.57	9.23	8.61	9.64	----
ø Total Cations	----	0.01	meq/L		9.67	9.39	8.46	8.94	----
ø Ionic Balance	----	0.01	%		6.01	0.84	0.85	3.80	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.26	<0.02	0.13	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.04	0.20	<0.02	0.28	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.05	4.21	<0.01	17.0	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.55	<0.02	10.2	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.05	30.2	0.02	103	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		1.0	0.2	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		4.61	0.51	<0.02	0.15	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		4.44	1.08	<0.02	0.92	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		1.23	0.21	<0.02	0.47	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_220908	0089_MW220_220908	0089_MW224_220908	0089_MW282_220908	0089_QC301_220908
				Sampling date / time	08-Sep-2022 08:05	08-Sep-2022 08:13	08-Sep-2022 08:14	08-Sep-2022 08:16	08-Sep-2022 09:30
Compound	CAS Number	LOR	Unit		EP2211535-001	EP2211535-002	EP2211535-003	EP2211535-004	EP2211535-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.37**	**0.45**	<0.01	**9.32**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.04**	<0.02	**0.05**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**12.5**	**0.14**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.24**	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_220908	0089_MW220_220908	0089_MW224_220908	0089_MW282_220908	0089_QC301_220908
				Sampling date / time	08-Sep-2022 08:05	08-Sep-2022 08:13	08-Sep-2022 08:14	08-Sep-2022 08:16	08-Sep-2022 09:30
Compound	CAS Number	LOR	Unit		EP2211535-001	EP2211535-002	EP2211535-003	EP2211535-004	EP2211535-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**24.5**	**38.0**	**0.02**	**142**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.10**	**34.4**	**0.02**	**120**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**24.5**	**37.3**	**0.02**	**131**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.1**	**99.8**	**103**	**97.5**	**96.1**
13C8-PFOA	----	0.02	%		**94.0**	**96.8**	**96.5**	**94.0**	**95.0**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC401_220908	----	----	----	----
				Sampling date / time	08-Sep-2022 09:31	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211535-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC401_220908	----	----	----	----
				Sampling date / time	08-Sep-2022 09:31	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2211535-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.2**	----	----	----	----
13C8-PFOA	----	0.02	%		**100**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211535**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 12-Sep-2022
C-O-C number	: 42171	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4588650)									
EP2211535-003	0089_MW224_220908	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	234	236	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	234	236	0.9	0% - 20%
EP2211439-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	420	429	2.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	420	429	2.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4572078)									
EP2211401-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2670	2620	1.6	0% - 20%
EP2211401-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2590	5.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4572077)									
EP2211401-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18600	18400	1.3	0% - 20%
EP2211401-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18300	18600	1.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4572111)									
EP2211390-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	68	69	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	58	58	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	180	181	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%
EP2211391-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	441	449	1.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1440	2.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	11200	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	502	509	1.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4589529)									
EP2211535-001	0089_MW217_220908	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.10	61.6	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.05	0.06	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2233277-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.28	0.27	5.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4589529)									
EP2211535-001	0089_MW217_220908	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.37	0.34	8.1	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	4.61	4.30	7.0	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	4.44	4.05	9.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.23	1.14	7.5	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.0	0.9	17.1	0% - 50%
ES2233277-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.09	0.08	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4589529)									
EP2211535-001	0089_MW217_220908	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4589529) - continued									
EP2211535-001	0089_MW217_220908	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2233277-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4589529)									
EP2211535-001	0089_MW217_220908	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	12.5	11.9	4.5	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	0.24	0.20	14.4	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2233277-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.74	0.76	1.6	0% - 50%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	0.64	0.65	0.0	0% - 50%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	0.21	0.20	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4589529)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4589529) - continued									
EP2211535-001	0089_MW217_220908	EP231X: Sum of PFAS	----	0.01	µg/L	24.5	23.0	6.3	0% - 20%
ES2233277-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	2.09	2.09	0.0	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4588650)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	87.8	118
				<1	200 mg/L	97.2	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4572078)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4572077)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	97.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4572111)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	109	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4589529)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	83.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	82.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	89.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	88.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	81.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4589529)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	86.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	91.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	94.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4589529) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4589529)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	106	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	89.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.8	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.2	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	104	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4589529)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	87.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	89.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	101	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	88.4	71.4	144

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4572078)							
EP2211401-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4572077)							
EP2211401-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4589529)							
EP2211535-002	0089_MW220_220908	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	78.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	81.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4589529) - continued							
EP2211535-002	0089_MW220_220908	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	111	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	124	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4589529)							
EP2211535-002	0089_MW220_220908	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	84.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	81.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	89.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	80.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	87.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	107	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	111	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	104	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4589529)							
EP2211535-002	0089_MW220_220908	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	107	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	104	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	109	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	95.0	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.8	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	118	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	113	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4589529)							
EP2211535-002	0089_MW220_220908	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	98.4	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	76.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	107	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	94.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211535**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 09-Sep-2022
Site	: Stirling GW - JS	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211401--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2211401--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2211535--002	0089_MW220_220908	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2211535--002	0089_MW220_220908	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2211535--002	0089_MW220_220908	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW217_220908,	0089_MW220_220908,	**08-Sep-2022**	**----**	----	----	**19-Sep-2022**	22-Sep-2022	✓
0089_MW224_220908,	0089_MW282_220908							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW217_220908,	0089_MW220_220908,	**08-Sep-2022**	**----**	----	----	**20-Sep-2022**	06-Oct-2022	✓
0089_MW224_220908,	0089_MW282_220908							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW217_220908,	0089_MW220_220908,	**08-Sep-2022**	**----**	----	----	**20-Sep-2022**	06-Oct-2022	✓
0089_MW224_220908,	0089_MW282_220908							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW217_220908, 0089_MW220_220908, 0089_MW224_220908, 0089_MW282_220908	**08-Sep-2022**	**----**	----	----	**12-Sep-2022**	15-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_220908, 0089_MW220_220908, 0089_MW224_220908, 0089_MW282_220908, 0089_QC301_220908, 0089_QC401_220908	**08-Sep-2022**	**21-Sep-2022**	07-Mar-2023	✓	**21-Sep-2022**	07-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_220908, 0089_MW220_220908, 0089_MW224_220908, 0089_MW282_220908, 0089_QC301_220908, 0089_QC401_220908	**08-Sep-2022**	**21-Sep-2022**	07-Mar-2023	✓	**21-Sep-2022**	07-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW217_220908, 0089_MW220_220908, 0089_MW224_220908, 0089_MW282_220908, 0089_QC301_220908, 0089_QC401_220908	**08-Sep-2022**	**21-Sep-2022**	07-Mar-2023	✓	**21-Sep-2022**	07-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_220908, 0089_MW220_220908, 0089_MW224_220908, 0089_MW282_220908, 0089_QC301_220908, 0089_QC401_220908	**08-Sep-2022**	**21-Sep-2022**	07-Mar-2023	✓	**21-Sep-2022**	07-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW217_220908, 0089_MW220_220908, 0089_MW224_220908, 0089_MW282_220908, 0089_QC301_220908, 0089_QC401_220908	**08-Sep-2022**	**21-Sep-2022**	07-Mar-2023	✓	**21-Sep-2022**	07-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS COC#: 42117 ALS Laboratory: EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 1700 7/9/22	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE:

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW227		07/09/2022 08:42 AM	Water	ALS: 5 Non ALS: 0	No	Partial 4/8			
002	0089_QC301			Water	ALS: 0 Non ALS: 0	No		X		
003	0089_QC302			Water	ALS: 0 Non ALS: 0	No		X		
004	0089_QC401		07/09/2022 11:52 AM	Water	ALS: 2 Non ALS: 0	No		X		
005	0089_QC402			Water	ALS: 0 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: **42117** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: / ES2022MWHAUS0002

QUOTE NO: SY/139/19 B

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0089_MW227	Ground Waters WATER	Water	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

Wednesday, September 7, 2022 11:51:46 AM

CHAIN OF CUSTODY

COC#: **42117** *ALS Laboratory:* EP Perth

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE:
QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0089_MW227	HDPE (no PTFE)	20 mL	00350821012859	Grey	No	
001	0089_MW227	HDPE (no PTFE)	20 mL	00350821012846	Grey	No	
001	0089_MW227	HDPE (no PTFE)	20 mL	00352101057713	Grey	No	
001	0089_MW227	Clear Plastic Bottle - Natural	500 mL	00070821057241	Green	No	
001	0089_MW227	HDPE (no PTFE)	20 mL	00350821012973	Grey	No	
004	0089_QC401	HDPE (no PTFE)	20 mL	00352101038354	Grey	No	
004	0089_QC401	HDPE (no PTFE)	20 mL	00350821012891	Grey	No	

Total Bottle Count: ALS: 7, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2211611**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: WA_0089_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 42117	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 07-Sep-2022 17:00	Issue Date	: 14-Sep-2022
Client Requested Due Date	: 23-Sep-2022	Scheduled Reporting Date	: **23-Sep-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 20.5 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2211611-001	07-Sep-2022 08:42	0089_MW227_220907	✓	✓	✓	✓
EP2211611-002	07-Sep-2022 19:50	0089_QC301_220907		✓		
EP2211611-003	07-Sep-2022 19:50	0089_QC302_220907		✓		
EP2211611-004	07-Sep-2022 11:52	0089_QC401_220907		✓		
EP2211611-005	07-Sep-2022 19:50	0089_QC402_220907		✓		

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — [redacted]

[redacted] **(STANTEC)**
- *AU Certificate of Analysis - NATA (COA) — Email — [redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — [redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — [redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — [redacted]stantec.com
- Chain of Custody (CoC) (COC) — Email — [redacted]stantec.com
- EDI Format - ESDAT (ESDAT) — Email — [redacted]stantec.com
- EDI Format - XTab (XTAB) — Email — [redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2211611**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42117	Issue Date	: 23-Sep-2022 14:03
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- EP231X-INJ: The direct injection LCMSMS method may be used where the sample matrix is not suitable for Solid Phase Extraction (e.g. significant particulate load) or where only a single sample container is received.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW227_220907	0089_QC401_220907	----	----	----
				Sampling date / time	07-Sep-2022 08:42	07-Sep-2022 11:52	----	----	----
Compound	CAS Number	LOR	Unit		EP2211611-001	EP2211611-004	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		374	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		374	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		255	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		968	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		134	----	----	----	----
Magnesium	7439-95-4	1	mg/L		78	----	----	----	----
Sodium	7440-23-5	1	mg/L		574	----	----	----	----
Potassium	7440-09-7	1	mg/L		40	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		40.1	----	----	----	----
ø Total Cations	----	0.01	meq/L		39.1	----	----	----	----
ø Ionic Balance	----	0.01	%		1.25	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L		<0.10	<0.10	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW227_220907	0089_QC401_220907	----	----	----
				Sampling date / time	07-Sep-2022 08:42	07-Sep-2022 11:52	----	----	----
Compound	CAS Number	LOR	Unit		EP2211611-001	EP2211611-004	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW227_220907	0089_QC401_220907	----	----	----
				Sampling date / time	07-Sep-2022 08:42	07-Sep-2022 11:52	----	----	----
Compound	CAS Number	LOR	Unit		EP2211611-001	EP2211611-004	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.2**	**95.8**	----	----	----
13C8-PFOA	----	0.02	%		**97.4**	**94.9**	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220907	0089_QC302_220907	0089_QC402_220907	----	----
				Sampling date / time	07-Sep-2022 19:50	07-Sep-2022 19:50	07-Sep-2022 19:50	----	----
Compound	CAS Number	LOR	Unit		EP2211611-002	EP2211611-003	EP2211611-005	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L		<0.10	<0.10	<0.10	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_220907	0089_QC302_220907	0089_QC402_220907	----	----
				Sampling date / time	07-Sep-2022 19:50	07-Sep-2022 19:50	07-Sep-2022 19:50	----	----
Compound	CAS Number	LOR	Unit		EP2211611-002	EP2211611-003	EP2211611-005	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**94.9**	**101**	----	----
13C8-PFOA	----	0.02	%		**93.7**	**88.8**	**96.2**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

(WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2211611**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara Western Australia Australia 6065
Telephone	: ----	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Sep-2022
C-O-C number	: 42117	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, Western Australia

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4588650)									
EP2211535-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	234	236	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	234	236	0.9	0% - 20%
EP2211439-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	420	429	2.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	420	429	2.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4577901)									
EP2211495-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	474	474	0.0	0% - 20%
EP2211675-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	26	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4577899)									
EP2211495-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2530	2560	1.4	0% - 20%
EP2211675-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	5	5	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4577338)									
EP2211495-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	117	117	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	263	262	0.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1520	1510	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	93	94	1.3	0% - 20%
EP2211496-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	435	430	1.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1420	1400	1.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11100	11000	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	502	497	1.1	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4593903)									
EP2211611-001	0089_MW227_220907	EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4593903)									
EP2211611-001	0089_MW227_220907	EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	<0.10	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4593903)									
EP2211611-001	0089_MW227_220907	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4593903)									
EP2211611-001	0089_MW227_220907	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4593903)									
EP2211611-001	0089_MW227_220907	EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4588650)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	87.8	118
				<1	200 mg/L	97.2	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4577901)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	100	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4577899)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	104	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4577338)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.8	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.9	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.8	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4593903)								
EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	84.8	72.0	130
EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	101	71.0	127
EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.5 µg/L	91.0	68.0	131
EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	93.4	69.0	134
EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	91.4	65.0	140
EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	94.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4593903)								
EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	2.5 µg/L	95.6	73.0	129
EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	90.2	72.0	129
EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	109	72.0	129
EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	92.4	72.0	130
EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	96.4	71.0	133
EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	95.8	69.0	130
EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	96.2	71.0	129
EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	97.2	69.0	133
EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	103	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4593903) - continued								
EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	95.2	65.0	144
EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4593903)								
EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	95.6	67.0	137
EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	113	68.0	141
EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	120	68.4	127
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	103	64.4	132
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	104	60.2	125
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	100	65.0	136
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	102	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4593903)								
EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	94.4	63.0	143
EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	97.0	64.0	140
EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	98.6	67.0	138
EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	74.2	62.7	135
EP231P: PFAS Sums (QCLot: 4593903)								
EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4577901)							
EP2211495-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4577899)							
EP2211495-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	86.6	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4593903)							
EP2211611-001	0089_MW227_220907	EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	87.6	72.0	130
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	103	71.0	127
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	91.8	68.0	131
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	97.4	69.0	134
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	94.4	65.0	140
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	95.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4593903)							
EP2211611-001	0089_MW227_220907	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	85.1	73.0	129
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	105	72.0	129
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	111	72.0	129
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	93.0	72.0	130
		EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	98.4	71.0	133
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	97.6	69.0	130
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	104	71.0	129
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	105	69.0	133
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	102	72.0	134
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	104	65.0	144
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	111	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4593903)							
EP2211611-001	0089_MW227_220907	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	94.2	67.0	137
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	106	68.0	141
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	99.4	68.5	127
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	1.25 µg/L	87.3	64.4	132
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	102	60.2	125
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	101	65.0	136
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	100	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4593903)							
EP2211611-001	0089_MW227_220907	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	86.6	63.0	143
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	94.8	64.0	140
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	95.8	67.0	138
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	74.2	62.7	135

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2211611**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: [redacted]
Project	: WA_0089_PFASOMP	Date Samples Received	: 07-Sep-2022
Site	: Stirling GW - JS	Issue Date	: 23-Sep-2022
Sampler	: [redacted] [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2211495--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW227_220907	**07-Sep-2022**	**----**	----	----	**19-Sep-2022**	21-Sep-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW227_220907	**07-Sep-2022**	**----**	----	----	**19-Sep-2022**	05-Oct-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW227_220907	**07-Sep-2022**	**----**	----	----	**19-Sep-2022**	05-Oct-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW227_220907	**07-Sep-2022**	**----**	----	----	**13-Sep-2022**	14-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-INJ)							
0089_MW227_220907, 0089_QC302_220907, 0089_QC402_220907, 0089_QC301_220907, 0089_QC401_220907,	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-INJ)							
0089_MW227_220907, 0089_QC302_220907, 0089_QC402_220907, 0089_QC301_220907, 0089_QC401_220907,	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-INJ)							
0089_MW227_220907, 0089_QC301_220907, 0089_QC302_220907, 0089_QC401_220907, 0089_QC402_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-INJ)							
0089_MW227_220907, 0089_QC301_220907, 0089_QC302_220907, 0089_QC401_220907, 0089_QC402_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-INJ)							
0089_MW227_220907, 0089_QC301_220907, 0089_QC302_220907, 0089_QC401_220907, 0089_QC402_220907	**07-Sep-2022**	**21-Sep-2022**	06-Mar-2023	✓	**21-Sep-2022**	06-Mar-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with mobile phase solvent. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.

Preparation Methods	Method	Matrix	Method Descriptions
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to analysis.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name [redacted]	Purchase Order : 304700525/730	COC Number : 304700525/730 -01
Office Address : 11 Harvest Terrace, West perth, WA, 6005		PROJECT Number : WA_0089_PFASOMP	Eurofins | mgt quote ID :
	Email for COC/SRN/Results : [redacted]	PROJECT Name : WA_0089_PFASOMP	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to [redacted] with the project No in the header file

Please send invoice to [redacted]

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

	Sample ID	Date	Matrix	Analytes: PFAS (28 analytes)	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar		Sample comments:
1	0089_QC201_220905	5/09/2022	Water	X									
2	0089_QC202_220905	5/09/2022	Water	X									
3	0089_QC203_220905	5/09/2022	Water	X									
4	0089_QC204_220905	5/09/2022	Water	X									
5	0089_QC205_220905	5/09/2022	Soil	X									
6	0089_QC206_220905	5/09/2022	Water	X									
7	0089_QC207_220905	5/09/2022	Soil	X									
8	0089_QC208_220905	5/09/2022	Water	X									
9	0089_QC209_220905	5/09/2022	Soil	X									
10	0089_QC210_220905	5/09/2022	water	X									
11	0089_QC211_220905	5/09/2022	water	X									
12	0089_QC212_220905	5/09/2022	Soil	X									
13	0089_QC213_220905	5/09/2022	Water	X									
14	0089_QC214_220905	5/09/2022	Water	X									
15	0089_QC215_220905	5/09/2022	water	X									
16	0089_QC216_220905	5/09/2022	water	X									
17	0089_QC217_220905	5/09/2022	water	X									
18	0089_QC218_220905	5/09/2022	water	X									

Laboratory Staff

Relinquished By:
Stantec Australia

Date & Time : 5/09/2022

Signature:

Rec [redacted]

Date & Time : 6/9/22 13:30

Signature [redacted]

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐

STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal

Courier Consignment # :

Temperature on arrival: 16.0 °C

Report number:

920981

eurofins

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Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: Wa_0089_PFASOMP
Project ID: Wa_0089_PFASOMP

Order No.: 304700525/730
Report #: 920981
Phone: 0458 839 200
Fax:

Received: Sep 6, 2022 1:30 PM
Due: Sep 15, 2022
Priority: 7 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	0089_QC201_220905	Sep 05, 2022		Water	L22-Se0011666		X	
2	0089_QC202_220905	Sep 05, 2022		Water	L22-Se0011667		X	
3	0089_QC203_220905	Sep 05, 2022		Water	L22-Se0011668		X	
4	0089_QC204_220905	Sep 05, 2022		Water	L22-Se0011669		X	
5	0089_QC206_220905	Sep 05, 2022		Water	L22-Se0011671		X	
6	0089_QC207_220905	Sep 05, 2022		Soil	L22-Se0011672	X		X
7	0089_QC208_220905	Sep 05, 2022		Water	L22-Se0011673		X	
8	0089_QC210_220905	Sep 05, 2022		Water	L22-Se0011674		X	

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Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
External Laboratory								
9	0089_QC211_220905	Sep 05, 2022		Water	L22-Se0011675		X	
10	0089_QC212_220905	Sep 05, 2022		Soil	L22-Se0011676	X		X
11	0089_QC213_220905	Sep 05, 2022		Water	L22-Se0011677		X	
12	0089_QC214_220905	Sep 05, 2022		Water	L22-Se0011678		X	
13	0089_QC215_220905	Sep 05, 2022		Water	L22-Se0011679		X	
14	0089_QC216_220905	Sep 05, 2022		Water	L22-Se0011680		X	
15	0089_QC217_220905	Sep 05, 2022		Water	L22-Se0011681		X	
16	0089_QC218_220905	Sep 05, 2022		Water	L22-Se0011682		X	
17	0089_QC209_220905	Sep 05, 2022		Soil	L22-Se0011757	X		X

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Project ID: Wa_0089_PFASOMP

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Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	PFAS (Full Suite) Water Std	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
External Laboratory								
18	0089_QC205_220905	Sep 05, 2022		Soil	L22-Se0018563	X		X
Test Counts						4	14	4

Stantec Australia Pty Limited
6F 226,Adelaide Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **920981-S**
Project name WA_0089_PFASOMP
Project ID WA_0089_PFASOMP
Received Date Sep 06, 2022

Client Sample ID			**0089_QC207_220905**	**0089_QC212_220905**	**0089_QC209_220905**	**0089_QC205_220905**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-Se0011672**	**L22-Se0011676**	**L22-Se0011757**	**L22-Se0018563**
Date Sampled			**Sep 05, 2022**	**Sep 05, 2022**	**Sep 05, 2022**	**Sep 05, 2022**
Test/Reference	LOR	Unit				
% Moisture	1	%	29	30	32	28
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	29	31	32	33
13C5-PFPeA (surr.)	1	%	49	55	54	57
13C5-PFHxA (surr.)	1	%	52	58	59	64
13C4-PFHpA (surr.)	1	%	49	56	58	61
13C8-PFOA (surr.)	1	%	48	56	55	60
13C5-PFNA (surr.)	1	%	52	57	60	67
13C6-PFDA (surr.)	1	%	49	55	55	61
13C2-PFUnDA (surr.)	1	%	56	65	69	79
13C2-PFDoDA (surr.)	1	%	44	50	50	61
13C2-PFTeDA (surr.)	1	%	37	43	46	58
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			0089_QC207_220905	0089_QC212_220905	0089_QC209_220905	0089_QC205_220905
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-Se0011672**	**L22-Se0011676**	**L22-Se0011757**	**L22-Se0018563**
Date Sampled			**Sep 05, 2022**	**Sep 05, 2022**	**Sep 05, 2022**	**Sep 05, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	54	64	68	71
D3-N-MeFOSA (surr.)	1	%	58	65	67	78
D5-N-EtFOSA (surr.)	1	%	38	44	46	54
D7-N-MeFOSE (surr.)	1	%	40	48	50	55
D9-N-EtFOSE (surr.)	1	%	36	41	44	50
D5-N-EtFOSAA (surr.)	1	%	34	41	44	44
D3-N-MeFOSAA (surr.)	1	%	36	44	44	50
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	50	57	56	59
18O2-PFHxS (surr.)	1	%	49	52	52	60
13C8-PFOS (surr.)	1	%	52	61	64	68
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	32	35	35	39
13C2-6:2 FTSA (surr.)	1	%	24	28	29	30
13C2-8:2 FTSA (surr.)	1	%	67	68	72	85
13C2-10:2 FTSA (surr.)	1	%	29	35	38	48
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Welshpool	Sep 09, 2022	14 Days
- Method: ARL135 Moisture in Solids			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Sep 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Sep 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Sep 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Sep 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 27, 2022	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_220905	Sep 05, 2022		Water	L22-Se0011666		X
2	0089_QC202_220905	Sep 05, 2022		Water	L22-Se0011667		X
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5	0089_QC206_220905	Sep 05, 2022		Water	L22-Se0011671		X
6	0089_QC207_220905	Sep 05, 2022		Soil	L22-Se0011672	X	X
7	0089_QC208_220905	Sep 05, 2022		Water	L22-Se0011673		X

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Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
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11	0089_QC213_220905	Sep 05, 2022		Water	L22-Se0011677		X
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Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
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Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
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17	0089_QC209_220905	Sep 05, 2022		Soil	L22-Se0011757	X	X
18	0089_QC205_220905	Sep 05, 2022		Soil	L22-Se0018563	X	X
Test Counts						4	18

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	73			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	77			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	70			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	71			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	73			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	77			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	75			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	74			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	73			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	71			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	77			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	77			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	77			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	72			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	78			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	77			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	71			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	75			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	72			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	85			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	76			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	76			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	80			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	80			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	77			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	77			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	75			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	K22-Se0046153	NCP	%	90			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	K22-Se0046153	NCP	%	91			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	K22-Se0046153	NCP	%	87			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	K22-Se0046153	NCP	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	K22-Se0046153	NCP	%	97			50-150	Pass	
Perfluorononanoic acid (PFNA)	K22-Se0046153	NCP	%	86			50-150	Pass	
Perfluorodecanoic acid (PFDA)	K22-Se0046153	NCP	%	89			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	K22-Se0046153	NCP	%	90			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	K22-Se0046153	NCP	%	93			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	K22-Se0046153	NCP	%	73			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	K22-Se0046153	NCP	%	92			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	K22-Se0046153	NCP	%	83			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	K22-Se0046153	NCP	%	96			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	K22-Se0046153	NCP	%	87			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	K22-Se0046153	NCP	%	89			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	K22-Se0046153	NCP	%	92			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	K22-Se0046153	NCP	%	90			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	K22-Se0046153	NCP	%	102			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	K22-Se0046153	NCP	%	83			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	K22-Se0046153	NCP	%	114			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	K22-Se0046153	NCP	%	87			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	K22-Se0046153	NCP	%	93			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	K22-Se0046153	NCP	%	98			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	K22-Se0046153	NCP	%	71			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	K22-Se0046153	NCP	%	90			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	K22-Se0046153	NCP	%	89			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	K22-Se0046153	NCP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	K22-Se0046153	NCP	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	K22-Se0046153	NCP	%	111			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	K22-Se0046153	NCP	%	94			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M22-Se0058480	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M22-Se0058480	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M22-Se0058480	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M22-Se0058480	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L22-Se0018563	CP	%	28	26	8.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS
[redacted] Senior Analyst-Sample Properties

[redacted]
[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Stantec Australia Pty Limited
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WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: [redacted]

Report **920981-W**
Project name WA_0089_PFASOMP
Project ID WA_0089_PFASOMP
Received Date Sep 06, 2022

Client Sample ID			**0089_QC201_220905**	**0089_QC202_220905**	**0089_QC203_220905**	**0089_QC204_220905**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-Se0011666**	**L22-Se0011667**	**L22-Se0011668**	**L22-Se0011669**
Date Sampled			**Sep 05, 2022**	**Sep 05, 2022**	**Sep 05, 2022**	**Sep 05, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.23	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	1.1	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	4.6	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.36	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]1.8	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	0.03	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	65	61	47	50
13C5-PFPeA (surr.)	1	%	81	105	102	106
13C5-PFHxA (surr.)	1	%	51	107	106	108
13C4-PFHpA (surr.)	1	%	89	101	99	102
13C8-PFOA (surr.)	1	%	96	102	98	103
13C5-PFNA (surr.)	1	%	96	109	122	112
13C6-PFDA (surr.)	1	%	65	75	84	73
13C2-PFUnDA (surr.)	1	%	55	62	74	60
13C2-PFDoDA (surr.)	1	%	50	55	68	55
13C2-PFTeDA (surr.)	1	%	27	41	56	46
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	93	93	112	101
D3-N-MeFOSA (surr.)	1	%	67	74	78	71

Client Sample ID			0089_QC201_220905	0089_QC202_220905	0089_QC203_220905	0089_QC204_220905
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0011666	L22-Se0011667	L22-Se0011668	L22-Se0011669
Date Sampled			Sep 05, 2022	Sep 05, 2022	Sep 05, 2022	Sep 05, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	67	75	80	67
D7-N-MeFOSE (surr.)	1	%	48	43	58	44
D9-N-EtFOSE (surr.)	1	%	46	47	57	52
D5-N-EtFOSAA (surr.)	1	%	68	65	89	68
D3-N-MeFOSAA (surr.)	1	%	45	54	70	56
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	[N09]0.49	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	[N09]0.21	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.96	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]22	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]1.2	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]60	[N09]0.02	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	73	103	102	105
18O2-PFHxS (surr.)	1	%	88	104	104	104
13C8-PFOS (surr.)	1	%	91	87	97	87
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	147	64	52	54
13C2-6:2 FTSA (surr.)	1	%	92	91	83	82
13C2-8:2 FTSA (surr.)	1	%	56	91	97	92
13C2-10:2 FTSA (surr.)	1	%	59	65	92	74
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	82	0.02	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	61.8	0.02	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	83.8	0.02	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	90.58	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	92.98	< 0.1	< 0.1	< 0.1

Client Sample ID			0089_QC206_220905	0089_QC208_220905	0089_QC210_220905	0089_QC211_220905
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0011671	L22-Se0011673	L22-Se0011674	L22-Se0011675
Date Sampled			Sep 05, 2022	Sep 05, 2022	Sep 05, 2022	Sep 05, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			0089_QC206_220905	0089_QC208_220905	0089_QC210_220905	0089_QC211_220905
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0011671	L22-Se0011673	L22-Se0011674	L22-Se0011675
Date Sampled			Sep 05, 2022	Sep 05, 2022	Sep 05, 2022	Sep 05, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	58	53	51	67
13C5-PFPeA (surr.)	1	%	108	108	102	106
13C5-PFHxA (surr.)	1	%	106	109	107	103
13C4-PFHpA (surr.)	1	%	102	103	98	97
13C8-PFOA (surr.)	1	%	95	102	97	95
13C5-PFNA (surr.)	1	%	101	118	113	119
13C6-PFDA (surr.)	1	%	67	82	74	85
13C2-PFUnDA (surr.)	1	%	52	71	59	74
13C2-PFDoDA (surr.)	1	%	44	66	51	64
13C2-PFTeDA (surr.)	1	%	31	52	42	36
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	84	104	97	107
D3-N-MeFOSA (surr.)	1	%	58	71	60	61
D5-N-EtFOSA (surr.)	1	%	60	76	57	62
D7-N-MeFOSE (surr.)	1	%	41	53	44	52
D9-N-EtFOSE (surr.)	1	%	43	52	43	49
D5-N-EtFOSAA (surr.)	1	%	59	80	67	93
D3-N-MeFOSAA (surr.)	1	%	49	64	55	71
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	102	105	103	99
18O2-PFHxS (surr.)	1	%	100	106	105	101
13C8-PFOS (surr.)	1	%	77	97	84	96

Client Sample ID			0089_QC206_220905	0089_QC208_220905	0089_QC210_220905	0089_QC211_220905
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0011671	L22-Se0011673	L22-Se0011674	L22-Se0011675
Date Sampled			Sep 05, 2022	Sep 05, 2022	Sep 05, 2022	Sep 05, 2022
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	85	56	50	54
13C2-6:2 FTSA (surr.)	1	%	133	84	80	88
13C2-8:2 FTSA (surr.)	1	%	79	93	88	92
13C2-10:2 FTSA (surr.)	1	%	56	92	72	85
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			0089_QC213_220905	0089_QC214_220905	0089_QC215_220905	0089_QC216_220905
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0011677	L22-Se0011678	L22-Se0011679	L22-Se0011680
Date Sampled			Sep 05, 2022	Sep 05, 2022	Sep 05, 2022	Sep 05, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	0.03	< 0.01	0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	0.10	< 0.01	0.07
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	1.4
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	65	68	52	69
13C5-PFPeA (surr.)	1	%	89	105	105	107
13C5-PFHxA (surr.)	1	%	106	102	109	107
13C4-PFHpA (surr.)	1	%	99	96	100	103
13C8-PFOA (surr.)	1	%	94	99	104	102
13C5-PFNA (surr.)	1	%	107	120	122	114
13C6-PFDA (surr.)	1	%	66	77	81	84
13C2-PFUnDA (surr.)	1	%	48	61	69	79
13C2-PFDoDA (surr.)	1	%	42	54	58	67
13C2-PFTeDA (surr.)	1	%	37	34	43	45

Client Sample ID			0089_QC213_220905	0089_QC214_220905	0089_QC215_220905	0089_QC216_220905
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-Se0011677**	**L22-Se0011678**	**L22-Se0011679**	**L22-Se0011680**
Date Sampled			**Sep 05, 2022**	**Sep 05, 2022**	**Sep 05, 2022**	**Sep 05, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	82	100	104	115
D3-N-MeFOSA (surr.)	1	%	56	60	72	73
D5-N-EtFOSA (surr.)	1	%	59	62	70	77
D7-N-MeFOSE (surr.)	1	%	42	51	54	57
D9-N-EtFOSE (surr.)	1	%	39	44	53	60
D5-N-EtFOSAA (surr.)	1	%	57	76	86	95
D3-N-MeFOSAA (surr.)	1	%	48	64	64	77
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	0.07	< 0.01	0.02
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	[N09]0.06	< 0.01	[N09]0.11
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	[N09]0.19	< 0.01	[N09]17
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]2.1
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	[N09]0.02	< 0.01	[N09]0.28
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	100	99	105	104
18O2-PFHxS (surr.)	1	%	100	100	101	87
13C8-PFOS (surr.)	1	%	79	88	86	111
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	97	55	52	69
13C2-6:2 FTSA (surr.)	1	%	94	88	86	91
13C2-8:2 FTSA (surr.)	1	%	81	89	85	69
13C2-10:2 FTSA (surr.)	1	%	55	75	87	103
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	0.21	< 0.01	17.28
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.02	< 0.01	1.68
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	0.21	< 0.01	18.68
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	0.41	< 0.05	18.79
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	0.49	< 0.1	21

Client Sample ID			0089_QC217_220905	0089_QC218_220905
Sample Matrix			Water	Water
Eurofins Sample No.			L22-Se0011681	L22-Se0011682
Date Sampled			Sep 05, 2022	Sep 05, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.05	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	68	57
13C5-PFPeA (surr.)	1	%	108	105
13C5-PFHxA (surr.)	1	%	105	103
13C4-PFHpA (surr.)	1	%	98	97
13C8-PFOA (surr.)	1	%	97	95
13C5-PFNA (surr.)	1	%	115	102
13C6-PFDA (surr.)	1	%	69	64
13C2-PFUnDA (surr.)	1	%	53	49
13C2-PFDoDA (surr.)	1	%	41	41
13C2-PFTeDA (surr.)	1	%	21	30
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	92	85
D3-N-MeFOSA (surr.)	1	%	56	56
D5-N-EtFOSA (surr.)	1	%	56	60
D7-N-MeFOSE (surr.)	1	%	44	37
D9-N-EtFOSE (surr.)	1	%	42	39
D5-N-EtFOSAA (surr.)	1	%	71	58
D3-N-MeFOSAA (surr.)	1	%	55	49
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.06	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.09	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.32	[N09]0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.07	[N09]0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			0089_QC217_220905	0089_QC218_220905
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**L22-Se0011681**	**L22-Se0011682**
Date Sampled			**Sep 05, 2022**	**Sep 05, 2022**
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
13C3-PFBS (surr.)	1	%	100	99
18O2-PFHxS (surr.)	1	%	99	101
13C8-PFOS (surr.)	1	%	85	78
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	59	57
13C2-6:2 FTSA (surr.)	1	%	90	97
13C2-8:2 FTSA (surr.)	1	%	83	71
13C2-10:2 FTSA (surr.)	1	%	66	53
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	0.39	0.02
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.08	0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.4	0.02
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.51	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	0.62	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Sep 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Sep 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Sep 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Sep 28, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 27, 2022	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP
Project ID: WA_0089_PFASOMP

Order No.: 304700525/730
Report #: 920981
Phone: 0458 839 200
Fax:

Received: Sep 6, 2022 1:30 PM
Due: Sep 15, 2022
Priority: 7 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_220905	Sep 05, 2022		Water	L22-Se0011666		X
2	0089_QC202_220905	Sep 05, 2022		Water	L22-Se0011667		X
3	0089_QC203_220905	Sep 05, 2022		Water	L22-Se0011668		X
4	0089_QC204_220905	Sep 05, 2022		Water	L22-Se0011669		X
5	0089_QC206_220905	Sep 05, 2022		Water	L22-Se0011671		X
6	0089_QC207_220905	Sep 05, 2022		Soil	L22-Se0011672	X	X
7	0089_QC208_220905	Sep 05, 2022		Water	L22-Se0011673		X

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Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
8	0089_QC210_220905	Sep 05, 2022		Water	L22-Se0011674		X
9	0089_QC211_220905	Sep 05, 2022		Water	L22-Se0011675		X
10	0089_QC212_220905	Sep 05, 2022		Soil	L22-Se0011676	X	X
11	0089_QC213_220905	Sep 05, 2022		Water	L22-Se0011677		X
12	0089_QC214_220905	Sep 05, 2022		Water	L22-Se0011678		X
13	0089_QC215_220905	Sep 05, 2022		Water	L22-Se0011679		X
14	0089_QC216_220905	Sep 05, 2022		Water	L22-Se0011680		X
15	0089_QC217_220905	Sep 05, 2022		Water	L22-Se0011681		X

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Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							X
External Laboratory							
16	0089_QC218_220905	Sep 05, 2022		Water	L22-Se0011682		X
17	0089_QC209_220905	Sep 05, 2022		Soil	L22-Se0011757	X	X
18	0089_QC205_220905	Sep 05, 2022		Soil	L22-Se0018563	X	X
Test Counts						4	18

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	91			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	100			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	85			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	82			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	78			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	80			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	98			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	76			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	103			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	106			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	99			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	96			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	107			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	71			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	126			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	94			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	90			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	74			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	87			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	84			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	96			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	81			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	77			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	92			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	84			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	73			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	97			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M22-Se0051666	NCP	%	100			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M22-Se0051666	NCP	%	106			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M22-Se0051666	NCP	%	93			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M22-Se0051666	NCP	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M22-Se0052859	NCP	%	78			50-150	Pass	
Perfluorononanoic acid (PFNA)	M22-Se0051666	NCP	%	84			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M22-Se0051666	NCP	%	77			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M22-Se0051666	NCP	%	77			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M22-Se0051666	NCP	%	73			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M22-Se0051666	NCP	%	86			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M22-Se0051666	NCP	%	91			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M22-Se0051666	NCP	%	115			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M22-Se0051666	NCP	%	104			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M22-Se0051666	NCP	%	130			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M22-Se0051666	NCP	%	122			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M22-Se0051666	NCP	%	126			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M22-Se0051666	NCP	%	104			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M22-Se0051666	NCP	%	90			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M22-Se0051666	NCP	%	96			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M22-Se0052859	NCP	%	87			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M22-Se0051666	NCP	%	82			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M22-Se0052859	NCP	%	78			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M22-Se0052859	NCP	%	72			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M22-Se0052859	NCP	%	109			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M22-Se0052859	NCP	%	74			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M22-Se0051666	NCP	%	81			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M22-Se0051666	NCP	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M22-Se0051666	NCP	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M22-Se0051666	NCP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M22-Se0051666	NCP	%	120			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M22-Se0051665	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M22-Se0051665	NCP	ug/L	0.02	0.02	4.8	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M22-Se0051665	NCP	ug/L	0.02	0.02	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M22-Se0057086	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M22-Se0051665	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M22-Se0051665	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M22-Se0051665	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M22-Se0051665	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M22-Se0051665	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M22-Se0051665	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M22-Se0051665	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M22-Se0051665	NCP	ug/L	0.06	0.06	2.1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M22-Se0057086	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M22-Se0051665	NCP	ug/L	0.02	0.02	1.8	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M22-Se0057086	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M22-Se0057086	NCP	ug/L	0.01	0.01	10	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M22-Se0057086	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M22-Se0057086	NCP	ug/L	0.02	0.02	7.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M22-Se0051665	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M22-Se0051665	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS

[redacted]
[redacted]
Business Unit Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

now

Stantec

Monitoring Date	Monitoring Location	Sample ID	Screen Interval (m)	TOC (mAHD)	Well Depth (m)	SWL Time	SWL (mbTOC)	RWL (mAHD)	Other Observations on Bore/Site	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour	Odour Comments	Colour
5/09/2022	MW109	0089_MW109_220905	2.5-5.5_	4.446	5.5	14:04	4.015	0.431		HydraSleeve	19.8	1.46	880	572	7.34	66.7	117/217	no		Cloudy
5/09/2022	MW112	0089_MW112_220905	3.0 - 6.0	3.973	6	13:49	3.355	0.618		HydraSleeve	19.6	1.63	515.5	334.75	7.67	59.2		no		Cloudy
5/09/2022	MW120	0089_MW120_220905	2.5-5.5_	4.409	5.5	13:37	3.947	0.462		HydraSleeve	19.1	3.42	670	435.5	7.7	60.1	116/216	no		Cloudy
5/09/2022	MW121	0089_MW121_220905	2.7-5.7_	3.7	5.7	13:22	3.225	0.475	Hydrasleeve broke during recovery	HandBailing	19	7.39	550.2	357.5	7.99	37.8		no		Cloudy
5/09/2022	MW123	0089_MW123_220905	4.5-8_	6.62	8	13:03	6.17	0.45		HydraSleeve	19.5	0.52	1460	942.5	7.59	-20.9	114/214	no		Clear
5/09/2022	MW124	0089_MW124_220905	0.75-4_	1.899	4	09:01	1.6	0.299	QC102/202	HydraSleeve	16.7	0.56	37916	29315	7.12	-314		yes	Hydrogen sulfide	Clear
5/09/2022	MW125	0089_MW125_220805	0.9-3.9_	1.882	3.9	09:50	1.58	0.302		HydraSleeve	19	0.21	41218	30279	7.16	-347.7		yes	Hydrogen sulfide odour	Clear
5/09/2022	MW126	0089_MW126_220905	0.9-3.9_	1.948	3.9	10:49	1.64	0.308		HydraSleeve	20.8	0.61	41207	29136	6.95	-344.4		yes	Strong hydrogen sulfide	Clear
5/09/2022	MW127	0089_MW127_220905	0.9-3.9_	1.771	3.9	11:45	1.48	0.291	QC113/213	HydraSleeve	20.5	1.11	39553	28139	7.37	-325		yes	Hydrogen sulfide smell	Clear
5/09/2022	MW128	0089_MW128_220905	2.5-5.5_	4.537	5.5	14:32	4.305	0.232	Insuficient water column for hydrasleeve	HandBailing	17.8	3.55	866	565.5	7.42	-36.7		no		Cloudy
5/09/2022	MW139	0089_MW139_220905	2-5_	2.273	5	09:00	1.895	0.378		HydraSleeve	17.6	2.34	839	546	7.9	86.6		no		Clear
5/09/2022	MW141	0089_MW141_220905	2-5_	3.025	5	09:25	2.66	0.365	QC101/201	HydraSleeve	17.4	0.89	24328	15814.5	7.1	-203.8	101/201	no		Clear
5/09/2022	MW142	0089_MW142_220905	0.25-4_	2.573	4	11:40	2.295	0.278	Bore now 50cm from edge of sand dune	HydraSleeve	16.9	0.88	23846	15522	7.24	29.3		no		Cloudy
5/09/2022	MW147		2-5_	3.423	5.2	09:32			Blocked at 2.5mbTOC									no		
5/09/2022	MW149	0089_MW149_220905	1-4_	2.303	4	11:50	2.02	0.283	Bore monument sits below bore casing due to beach erosion.	HydraSleeve	15.2	3.94	44742	29094	7.69	44.9		no		Clear
5/09/2022	MW158	0089_MW158_220905	NA	14.541	15.82	12:46	14.121	0.42		HydraSleeve	19.3	1.67	11811	7287.5	7.28	52.6		no		Clear
5/09/2022	MW161	0089_MW161_220905	NA	17.225	18.13	13:04	16.669	0.556		HydraSleeve	19.9	3.74	3152	1919.5	7.54	17.3		no		Clear
5/09/2022	MW166	0089_MW166_220905	10-13_	11.89	13	13:00	11.275	0.615		HydraSleeve	19.1	1.16	3797	2354	7.41	43.3		no		Clear
5/09/2022	MW171	0089_MW171_220905	28.5-31.5_	29.238	31.5	11:45	28.538	0.7		HydraSleeve	18.8	4.88	14325	8943	7.32	71.3		no		Clear
6/09/2022	MW172	0089_MW172_220906		16.772	26	08:52	16.357	0.415		HydraSleeve	16.4	3.99	3777	2491.5	7.42	-156.3		yes	Hydrocarbon	Clear
5/09/2022	MW173	0089_MW173_220905	NA	10.08	11.11	14:30	9.599	0.481		HydraSleeve	20.1	7.69	3927	2381.5	7.63	-28.1				Clear
5/09/2022	MW193	0089_MW193_220905	10.5-13.5_	11.86	13.5	13:55	11.249	0.611		HydraSleeve	20.2	1.09	3201	1941.5	7.37	-237.7		yes	Hydrocarbon	Clear
5/09/2022	MW195D	0089_MW195D_220905	10-13_	4.363	13	13:50	4.146	0.217		HydraSleeve	19.2	7.54	23420	17352.5	7.35	0.5		no		Clear
5/09/2022	MW195S	0089_MW195S_220905	3.5-6.5_	4.571	6.5	13:52	4.09	0.481		HydraSleeve	19.7	1.31	5351	3278	7.25	29		no		Clear
6/09/2022	MW196	0089_MW196_220906	NA	12.75	13.8	12:34	12.376	0.374		HydraSleeve	20.7	4.19	605	396.5	7.73	125.4		no		Cloudy
5/09/2022	MW197	0089_MW197_220905	NA	2.28	2.052	09:22	1.985	0.295		HydraSleeve	18.2	2.5	3358	2128.5	7.43	91.1		no		Clear
5/09/2022	MW199	0089_MW199_220905	NA	11.8	NA	11:01	11.344	0.456		HydraSleeve	20.5	4.39	6473	3877.5	7.52	42.8	QC111/211	no		Clear
5/09/2022	MW200	0089_MW200_220905	NA	2.07	NA	09:54	1.846	0.224		HydraSleeve	18.9	6.75	7487	4664	7.81	42.7		no		Clear
5/09/2022	MW202	0089_MW202_220905	NA	2.12	NA	13:18	1.4	0.72		HydraSleeve	19.1	4.12	3310	2423	7.56	-194.7		no		Clear
6/09/2022	MW203	0089_MW203_220906	NA	10.855	12.9	10:14	10.38	0.475		HydraSleeve	18.8	1.74	957	705	7.79	-63.3		no		Clear
6/09/2022	MW214	0089_MW214_220906	5.5-9_	8.075	9	09:46	7.545	0.53		HydraSleeve	16.5	3.82	2212	1457.5	7.04	-46.7		no		Clear
6/09/2022	MW215	0089_MW215_220906	1.5-4.5_	3.794		10:08	3.308	0.486		HydraSleeve	16.4	3.66	1293	852.5	7.56	-30.8		no		Clear
5/09/2022	MW216	0089_MW216_220905	6-9_	8.329	6	14:45	7.848	0.481		HydraSleeve	18.2	4.39	2104	1325.5	7.53	12		no		Clear
8/09/2022	MW217	0089_MW217_220908	6.5-9.5_	8.847	9.5	08:12	8.255	0.592		HydraSleeve	17.8	5.52	1122	845	7.53	-43.3		no		Cloudy
8/09/2022	MW220	0089_MW220_220908	NA	NA	NA	09:02	5.13			HydraSleeve	15.2	4.98	815	652	7.52	34.6		yes	Slight organic odour	Brown
8/09/2022	MW224	0089_MW224_220908	11.25-14.25_	13.372	14.25	08:41	12.25	1.122		HydraSleeve	18.3	7.54	814	606	7.81	-89.5		no		Clear
6/09/2022	MW225	0089_MW225_220906	2-5_	4.066	5	10:32	3.66	0.406		HydraSleeve	15.5	4.42	1548	1039.5	7.5	5.6	-	no		Clear
6/09/2022	MW226	0089_MW226_220906	0.75-3.8_	1.749	3.8	13:15	1.48	0.269		HydraSleeve	18.2	0.72	38453	28713	7.08	-191.7		yes	Slight hydrogen sulfide	Brown
7/09/2022	MW227	0089_MW227_220907	1.25-4.2_	2.961	4.2	09:00	2.61	0.351		HydraSleeve	17.8	2.66	4064	3066	7.19	-62.1		yes	Slight organic odour	Brown
7/09/2022	MW228	0089_MW228_220907	0.75-3.75_	2.23	3.75	08:41	1.893	0.337		HydraSleeve	16.3	1.7	10013	6506.5	7.48	152.1		no		Clear
6/09/2022	MW233	0089_MW233_220906	NA	3.705	4.968	09:57	2.64	1.065		HydraSleeve	14.7	4.62	824	662	8.66	-33.1		no		Clear
6/09/2022	MW236	0089_MW236_220906	NA	4.642	5.66	10:28	3.88	0.762		HydraSleeve	18.1	5.38	670	502	7.85	4.6		yes	Slight fuel odour	Brown
6/09/2022	MW238	0089_MW238_220906	NA	4.827	NA	11:04	3.98	0.847		HydraSleeve	18.2	4.37	636	416	7.83	76.5		no		Cloudy
6/09/2022	MW239	0089_MW239_220906	NA	4.03	NA	10:47	3.2	0.83	Well buried in sand stockpile	HydraSleeve	17.5	5.45	632	409.5	7.83	69.2		no		Cloudy
6/09/2022	MW240	0089_MW240_220906	NA	4.483	6.8	11:17	3.657	0.826		HydraSleeve	19.5	2.35	775	500.5	7.51	83.2		yes	Hydrocarbons	Cloudy
6/09/2022	MW242	0089_MW242_220906	NA	3.539	4.76	09:45	2.745	0.794		HydraSleeve	17.8	3.18	700	455	7.86	59.4		no		Clear
6/09/2022	MW243	0089_MW243_220906	NA	4.892	7	10:26	4.12	0.772		HydraSleeve	17.4	2.31	916	598	7.62	68		no		Clear
6/09/2022	MW245	0089_MW245_220906	NA	4.551	5.65	10:09	3.715	0.836		HydraSleeve	15.1	0.85	723	468	7.29	46.2		yes	Hydrocarbons	Clear
6/09/2022	MW249	0089_MW249_220906	3.5-6.5_	5.227	6.5	09:38	4.572	0.655		HydraSleeve	18.7	2.88	1209	786.5	7.42	48.5		no		Cloudy
6/09/2022	MW255	0089_MW255_220906	3-6_	4.609	6	13:25			SWL below hydrasleeve, not recorded	HydraSleeve	18.4	1.04	878	572	7.56	-58.7		no		Clear
6/09/2022	MW256	0089_MW256_220906	3-6_	3.84	6	13:14	3.09	0.75		HydraSleeve	17.8	0.7	1858	1209	7.13	-190.7		yes	H2S	Cloudy
6/09/2022	MW257	0089_MW257_220906	2.7-5.7_	3.806	5.7	13:38			SWL below hydrasleeve, not recorded	HydraSleeve	17.7	6.87	357	232.05	8.25	-1.4		no		Clear
6/09/2022	MW258	0089_MW258_220906	3-6_	4.043	6	13:49			SWL below hydrasleeve. not recorded.	HydraSleeve	19.2	1.7	1153	747.5	7.36	31.8		no		Cloudy
6/09/2022	MW259	0089_MW259_220906	2.5-5.5_	3.8	5.5	12:59	3.142	0.658		HydraSleeve	17.6	2.95	482.6	313.95	7.54	129.1		no		Clear
6/09/2022	MW261		3-6_	3.858	6	08:48			Lost - unable to retrieve with a metal detector	HydraSleeve										
6/09/2022	MW268	0089_MW268_220906	2.5-5.5_	4.056	5.5	10:51	3.66	0.396		HydraSleeve	18.2	1.97	5842	4369	7.25	-44.1		no		Clear
6/09/2022	MW269	0089_MW269_220906	2.5-5.5_	4.153	5.5	11:05	3.75	0.403		HydraSleeve	18.5	1.5	1578	1172	7.52	-10.8		yes	Slight organic odour	Clear
8/09/2022	MW282	0089_MW282_220908	4.5-7.5_	5.78	7.5	08:31	5.25	0.53		HydraSleeve	16.8	3.05	774	596	7.17	2.1		no		Brown
6/09/2022	MW288	0089_MW288_220906	2.25-5.25_	4.003	5.25	08:57	3.49	0.513		HydraSleeve	18.6	2.55	850	630	6.27	-134		no		Clear
5/09/2022	MW289	0089_MW289_220905	3.25-6.25_	4.495	6.25	14:35	3.8	0.695		HydraSleeve	21.4	1.77	1837	1285	7.92	-239		yes	Slight organic odour	Cloudy
6/09/2022	MW496	0089_MW496_220906	3.5-8_	5.092	8	09:05	4.639	0.453	Sampled instead of nearby damaged wells	HydraSleeve	17.2	0.73	1584	1027	7.46	133.4		no		Clear
5/09/2022	MW500	0089_MW500_220905	2-6.5_	3.692	6.5	14:19	3.25	0.442		HydraSleeve	20	1.12	699	455	7.42	65.3		no		Clear
6/09/2022	MW516	0089_MW516_220906	4.5-7.5_	6.37	7.5	09:16	5.87	0.5		HydraSleeve	18.5	0.68	2044	1326	7.3	50.6		no		Clear

Monitoring Date	Monitoring Location	Sample_ID	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour Comments	Colour
5/09/2022	PW304	0089_PW304_220905	Peristaltic Pump	20.1	1.54	8335	5974	7.67	-259.9			Clear
6/09/2022	PW306	0089_PW306_220906	Peristaltic Pump	17.8	6.78	42474	27060	8.13	20			Clear
6/09/2022	PW307	0089_PW307_220906	Peristaltic Pump	17.5	6.42	41877	26779.5	7.96	64.3			Clear
6/09/2022	PW308	0089_PW308_220906	Peristaltic Pump	18.2	6.63	42881	27060	8.04	10.1			Clear
6/09/2022	PW314	0089_PW314_220906	Peristaltic Pump	17.8	5.83	42404	26965	8.02	41.4			Clear
6/09/2022	PW315	0089_PW315_220906	Peristaltic Pump	17.2	6.46	38278	23164.5	8.13	20.7			Clear
6/09/2022	PW316	0089_PW316_220906	Peristaltic Pump	17.8	6.65	42533	27010.5	8.12	20.8			Clear
5/09/2022	PW329	0089_PW329_220905	Peristaltic Pump	15.9	1.1	54958	35724	7.76	-146.4			Clear
5/09/2022	PW330	0089_PW330_220905	Peristaltic Pump	15.9	0.88	56245	36569	7.73	-48.8			Clear
5/09/2022	PW331	0089_PW331_220905	Peristaltic Pump	16.9	2.74	53876	35028.5	7.8	-17.8	QC106/206		Clear
5/09/2022	PW335	0089_PW335_220905	Peristaltic Pump	15.9	0.91	44876	35344	7.54	-119.5			Clear
5/09/2022	PW340	0089_PW340_220905	Peristaltic Pump	15.2	1.96	25584	20278	7.66	-156.3			Clear
5/09/2022	PW341	0089_PW341_220905	Peristaltic Pump	18.6	0.93	48981	36254	7.79	-205.7			Clear
5/09/2022	PW345	0089_PW345_220905	Peristaltic Pump	17.8	5.16	41294	26295	7.89	86.6			Clear
6/09/2022	PW346	0089_PW346_220906	Peristaltic Pump	14.2	2.98	42328	34640	7.31	9.9			Clear
7/09/2022	PW350	0089_PW350_220907	Peristaltic Pump	15.2	6.71	47882	31122	8.11	116.2			Clear
7/09/2022	PW351	0089_PW351_220907	Peristaltic Pump	15.8	7.5	28328	18739.5	8.15	110.2			Clear
7/09/2022	PW352	0089_PW352_220907	Peristaltic Pump	17.6	7.85	46413	30166.5	8.16	108.7			Clear
5/09/2022	PW356	0089_PW356_220905	Peristaltic Pump	15.8	5.42	54010	35074	8.08	58.8		Seaweed	Clear
5/09/2022	PW357	0089_PW357_220905	Peristaltic Pump	16.6	0.7	55272	35925	7.74	-111.8			Clear
5/09/2022	PW358	0089_PW358_220905	Peristaltic Pump	15.9	1.12	55426	36036	7.38	-193.4			Clear
5/09/2022	PW362	0089_PW362_220905	Peristaltic Pump	18.9	1.42	48174	35364	7.64	-90.3	QC108/208		Clear
5/09/2022	PW363	0089_PW363_220905	Peristaltic Pump	17.7	1.15	47879	36134	7.8	-259.7			Clear
5/09/2022	PW364	0089_PW364_220905	Peristaltic Pump	16.1	0.8	44920	35138	7.49	-32			Clear
5/09/2022	PW367	0089_PW367_220905	Peristaltic Pump	19.7	5.16	45001	27291	7.9	72.7	QC110/210		Clear
5/09/2022	PW368	0089_PW368_220905	Peristaltic Pump	20.7	0.38	44515	31418	7.51	-327.3	QC118/218	Organic odour	Clear
5/09/2022	PW369	0089_PW369_220905	Peristaltic Pump	17.4	6.07	41771	26862	7.77	92.6			Clear
6/09/2022	PW374	0089_PW374_220906	Peristaltic Pump	16.9	3.58	46041	35376	7.86	-9.8			Clear
6/09/2022	PW375	0089_PW375_220906	Peristaltic Pump	17.1	3.52	43774	33502	7.7	26.8			Clear
6/09/2022	PW378	0089_PW378_220906	Peristaltic Pump	17.3	3.4	46871	35732	7.72	13.4			Clear
7/09/2022	PW380	0089_PW380_220907	Peristaltic Pump	15.7	8.48	46559	33584	8.15	111.2			Clear
7/09/2022	PW381	0089_PW381_220907	Peristaltic Pump	15.4	7.99	53813	34976.5	8.16	109.1			Clear
7/09/2022	PW401	0089_PW401_220907	Peristaltic Pump	15.8	7.71	53391	35028.5	8.19	112.9			Clear
7/09/2022	PW405	0089_PW405_220907	Peristaltic Pump	12.6	6.43	52883	34378.5	7.89	123			Clear
7/09/2022	PW407	0089_PW407_220907	Peristaltic Pump	14.4	3.59	43012	35090	7.74	26.8			Clear
6/09/2022	PW409	0089_PW409_220906	Peristaltic Pump	17.4	1.53	46427	35324	7.58	-119.8			Clear
6/09/2022	PW411	0089_PW411_220906	Peristaltic Pump	16.9	5.58	41241	26823.5	7.79	-1.9			Clear
6/09/2022	PW413	0089_PW413_220906	Peristaltic Pump	16.5	3.44	41255	27027	7.74	11.6			Clear
6/09/2022	PW415	0089_PW415_220906	Peristaltic Pump	17.1	3.1	41952	27082	7.76	24.8			Clear

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Table D3 - Surface water field records

PFAS OMP
Q3 2022
HMAS Stirling

Monitoring Location	Date	Sample ID	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	Comments	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Water Colour	Turbidity
SW130	5/09/2022	0089_SW130_220905	Direct into Bottle	0.1	0.3		15.4	4.4	43551	34771	6.45	28.3	Clear	Medium
SW132	5/09/2022	0089_SW132_220905	Direct into Bottle	0.1	0.4	QC104/204	18.4	2.74	47972	35675	7.78	-149.5	Clear	Medium
SW134	5/09/2022	0089_SW134_220905	Direct into Bottle	0.1	0.3		19.3	4.58	49207	35861	7.94	-124.4	Clear	Medium
SW150	5/09/2022	0089_SW150_220905	Direct into Bottle	0.1	1	Heavy rain overnight	16.2	5.54	53628	34866	8.1	3.1	Cloudy	Medium
SW152	5/09/2022	0089_SW152_220905	Direct into Bottle	0.1	1	QC103/203	16.4	6.31	54267	35269	8.13	32	Cloudy	Medium
SW154	5/09/2022	0089_SW154_220905	Direct into Bottle	0.1	1		16.4	5.47	54169	35217	8.09	42.7	Cloudy	Medium
SW156	5/09/2022	0089_SW156_220905	Direct into Bottle	0.1	0.9		16.4	5.54	54193	35223	8.12	50.3	Clear	Low
SW305	5/09/2022	0089_SW305_220905	Direct into Bottle	0.1	0.3	QC115/215	20.9	4.58	47079	33147	7.81	-117.5	Clear	Low
SW309	6/09/2022	0089_SW309_220906	Direct into Bottle	0.1	1		18.5	6.14	43478	27219	8.06	18.9	Clear	Medium
SW310	6/09/2022	0089_SW310_220906	Direct into Bottle	0.1	0.2		17.6	5.81	42081	26939	8.03	46.9	clear	Medium
SW311	6/09/2022	0089_SW311_220906	Direct into Bottle	0.1	1		18.3	6.55	43321	27247	8.02	17.4	Clear	Medium
SW317	6/09/2022	0089_SW317_220906	Direct into Bottle	0.1	0.4		18.1	4.64	45687	34182	7.85	11.8	Clear	Low
SW318	6/09/2022	0089_SW318_220906	Direct into Bottle	0.1	0.4		16.7	4.54	45310	35004	7.94	25	Clear	Low
SW319	6/09/2022	0089_SW319_220906	Direct into Bottle	0.1	0.4		16.8	4.01	45580	35033	7.91	-81.7	Clear	Low
SW353	7/09/2022	0089_SW353_220907	Direct into Bottle	0.1	1		16.2	6.42	53990	39053.5	8.18	118.2		Low
SW370	5/09/2022	0089_SW370_220905	Direct into Bottle	0.1	1		17.8	6.54	42646	27181	7.98	63.2	Vlear	Low
SW371	5/09/2022	0089_SW371_220905	Direct into Bottle	0.1	0.3		21.3	3.59	47227	32981	7.78	-235.4	Clear	Medium
SW372	6/09/2022	0089_SW372_220906	Direct into Bottle	0.1	0.4		14	5.06	41216	33930	7.84	-23.4	Clear	Low
SW373	6/09/2022	0089_SW373_220906	Direct into Bottle	0.1	0.4		15.1	4.94	42752	34249	7.19	8.2	Clear	Low
SW382	7/09/2022	0089_SW382_220907	Direct into Bottle	0.1	1		15.8	6.47	54119	35178	8.19	109.1	Clear	Low
SW383	7/09/2022	0089_SW383_220907	Direct into Bottle	0.1	1		15.9	6.49	53190	35223.5	8.2	111.3		Low
SW384	7/09/2022	0089_SW384_220907	Direct into Bottle	0.1	1		15.8	6.07	53380	35080.5	8.2	113.6	Clear	Medium
SW406	7/09/2022	0089_SW406_220907	Direct into Bottle	0.1	1		13.6	7.45	53221	34599.5	8.2	111.7		Low
SW408	7/09/2022	0089_SW408_220907	Direct into Bottle	0.1	0.3		14.9	6.35	22150	17838	7.7	25	Clear	Low
SW410	6/09/2022	0089_SW410_220906	Direct into Bottle	0.1	0.4		19.6	4.4	47561	34429	7.89	-3.8	Clear	Low
SW412	6/09/2022	0089_SW412_220906	Direct into Bottle	0.1	1		17.4	6.69	41793	26845.5	8.16	-8.5	Clear	Low
SW414	6/09/2022	0089_SW414_220906	Direct into Bottle	0.1	1		17.7	6.79	42074	26867	8.17	2.2	Clear	Low
SW416	6/09/2022	0089_SW416_220906	Direct into Bottle	0.1	1		18.7	6.45	42875	26823.5	8.15	67.5	Clear	Medium

Monitoring Location	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	QC Dup/Trip
SD369	5/09/2022	0089_SD369_220905	0.1	Shovel, Trowel	Wet	Grey. No odour	
SD345	5/09/2022	0089_SD345_220905	0.1	Shovel, Trowel	Wet	Grey sand	
SD367	5/09/2022	0089_SD367_220905	0.8	Shovel, Trowel	Wet	Grey sand	QC109/209
SD356	5/09/2022	0089_SD356_220905	0.8	Shovel, Trowel	Wet	Grey sand	
SD331	5/09/2022	0089_SD331_220905	0.5	Shovel, Trowel	Wet	Grey sand	
SD357	5/09/2022	0089_SD357_220905	0.8	Shovel, Trowel	Wet	Grey sand	QC107/207
SD330	5/09/2022	0089_SD330_220905	0.8	Shovel, Trowel	Wet	Grey sand	
SD358	5/09/2022	0089_SD358_220905	0.5	Shovel, Trowel	Wet	Grey coarse sand	
SD329	5/09/2022	0089_SD329_220905	0.8	Shovel, Trowel	Wet	Grey sand	
SD314	6/09/2022	0089_SD314_220906	0.8	Shovel, Trowel	Wet	Grey sand, Shell fragments	
SD307	6/09/2022	0089_SD307_220906	0.5	Shovel, Trowel	Wet	Grey sand, Shell fragments	
SD306	6/09/2022	0089_SD306_220906	0.5	Shovel, Trowel	Wet	Grey sand, Shell fragments	
SD315	6/09/2022	0089_SD315_220906	0.8	Shovel, Trowel	Wet	Yellow sand	
SD316	6/09/2022	0089_SD316_220906	0.8	Shovel, Trowel	Wet	Grey sand, Shell fragments	
SD308	6/09/2022	0089_SD308_220906	0.5	Shovel, Trowel	Wet	Grey sand, Shell fragments	
SD415	6/09/2022	0089_SD415_220906	0.8	Shovel, Trowel	Wet	Yellow sand	
SD413	6/09/2022	0089_SD413_220906	0.8	Shovel, Trowel	Wet	Yellow sand	
SD411	6/09/2022	0089_SD411220906	0.8	Shovel, Trowel	Wet	Grey sand	
SD405	7/09/2022	0089_SD405_220907	0.5	Shovel, Trowel	Wet	Grey sand	
SD350	7/09/2022	0089_SD350_220907	0.8	Shovel, Trowel	Wet	Grey sand	
SD401	7/09/2022	0089_SD401_220907	0.8	Shovel, Trowel	Wet	Grey sand	
SD351	7/09/2022	0089_SD351_220907	0.5	Shovel, Trowel	Wet	Grey sand	
SD381	7/09/2022	0089_SD381_220907	0.8	Shovel, Trowel	Wet	Grey sand	
SD352	7/09/2022	0089_SD352_220907	0.5	Shovel, Trowel	Wet	Grey sand	
SD335	5/09/2022	0089_SD335_220905	0.2	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD364	5/09/2022	0089_SD364_220905	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD340	5/09/2022	0089_SD340_220905	0.5	Shovel, Trowel	Wet	Sand, fine to med grained, sub angular to sub rounded, beige	QC105/205
SD362	5/09/2022	0089_SD362_220905	0.2	Shovel, Trowel	Wet	Sand, fine to med grained, grey, trace organics	
SD341	5/09/2022	0089_SD341_220905	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, beige mottled with grey, trace organics	
SD363	5/09/2022	0089_SD363_220905	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, beige mottled grey, trace organics	QC112/212
SD304	5/09/2022	0089_SD304_220905	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD368	5/09/2022	0089_SD368_220905	0.3	Shovel, Trowel	Wet	Sand, fine to medium grained, beige, trace organics	
SD346	6/09/2022	0089_SD346_220906	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD378	6/09/2022	0089_SD378_220906	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace shells	
SD375	6/09/2022	0089_SD375_220906	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD374	6/09/2022	0089_SD374_220906	0.3	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, trace shells	
SD409	6/09/2022	0089_SD409_220906	0.1	Shovel, Trowel	Wet	Sand, fine to med grained, well graded, trace organics	
SD407	7/09/2022	0089_SD407_220907	0.3	Shovel, Trowel	Wet	Sand, medium to coarse grained, beige, trace shell matter	

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20J100956
Cable length: 1m 20J100101

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.80 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.58
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 6 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	16.3	-1.2	°C	NA	15.1	°C
pH (21K)	pH 7.00	375757	7.01	-10.00	mV	7.05	7.01	pH
pH (21K)	pH 4.00	378281	4.00	162.80	mV	3.96	4.00	pH
Conductivity (20H100492)	2764 µs/cm at 25°C	21/1012	2764	GLP		5.00	2778	2764 µs/cm
ORP (201013SIA605102)	Zobell A & B	22/0103	251	251	mV	241.4	244.9	mV
Zero DO (20C100608)	NaSO3 in distilled water	10175	0.0	NA	NA	0	0.0	%
100% DO (20C100608)	100% Air Saturation	Air	100.0	3.95	uA	104.1	100.0	%

Calibrated by: [redacted]

Calibration Date: 18-Aug-22
Next Due: 14-Feb-23

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Calibration Report

Multi-Parameter Water Quality Instrument

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105325
Cable length: 4m (21F100778)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	
	Battery Saver	✓	Auto Shutoff after 30 min
Connections	Condition	✓	
Cable	Condition	✓	Clean, some duct tape
Display	Operation	✓	
Firmware	Version	✓	00:70
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings		
Monitor housing	Condition	✓	
pH			
Condition		✓	
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	[illegible]
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good & Clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	
Conductivity			
Condition		✓	
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

Parameter	Standards	Calibration Point	Units	Instrument Readings: Before		After		Units
Temperature	Check Temp NATA		°C	NA				°C
pH 21G	pH 7.00	7.01	mV	7.01		7.00		pH
pH 21G	pH 4.00	4.00	mV	4.07		4.0		pH
Conductivity (21H100008) 1413	~~2764~~ µs/cm at 25°C	~~2764~~ 1413	5.03	1250		1250		µs/cm
ORP (Reference check only) 21O	Zobell A & B	235	mV	235.7		235.7		mV
Zero DO (21G100131)	NaSO3 in distilled water	0.0	NA	0.00		0.0		%
100% DO (21G100131)	100% Air Saturation	100.0	uA	100		100		%

Calibrated by: [redacted]

Calibration Date: 1/9/22

Cardno now Stantec

Calibration Report

Multi-Parameter Water Quality Instrument

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105325
Cable length: 4m (21F100778)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	
	Battery Saver	✓	Turn off after 30m
Connections	Condition	✓	No breakages
Cable	Condition	✓	
Display	Operation	✓	
Firmware	Version	✓	4.c.c
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	
Conductivity			
Condition		✓	Good, Clean
Temperature		✓	
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

				Instrument Readings				
Parameter	Standards	Calibration Point	Units	Before		After		Units
Temperature	Check Temp NATA		°C	NA				°C
pH 21G	pH 7.00	7.01	mV	7.06		7.01		pH
pH 21G	pH 4.00	4.00	mV	4.06		4.00		pH
Conductivity (21H100008) 1413	2764 µs/cm at 25°C	2764 1413	5.03	12.36		1443		µs/cm
ORP (Reference check only) 21O	Zobell A & B	235	mV	239		235		mV
Zero DO (21G100131)	NaSO3 in distilled water	0.0	NA	0.50		0.00		%
100% DO (21G100131)	100% Air Saturation	100.0	uA	7.10		100.2		%

Calibrated by: [redacted]

Calibration Date: 2/8/2023

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
6/8/22	Stirling	YSI #21G1053 25	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y N 12,880µS/cm Y/N	11.8	pH 4.00: 4.08 pH 7.00: 7.04 EC: 14.20 12,890	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N		[redacted]	
6/8/22	Stirling	YSI # 20510956	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N EC 12,880µS/cm Y/N	12.2	pH 4.00: 4.17 pH 7.00: 7.14 EC: 14.20 12,995	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N			
6/8/22	Stirling	YSI # 20m YSI	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N 12,880µS/cm Y/N	11.6	pH 4.00: 4.18 pH 7.00: 7.19 EC: 14.80 12,889	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N			
7/8/22	Stirling	YSI #21G1053 25	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N EC 12,880 Y/N	9.4	pH 4.00: 4.16 pH 7.00: 7.09 Temp: EC: 13.33 12,788	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N			
7/8/22	Stirling	YSI # 20-100956	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N EC 12,880µS/cm Y/N	9.4	pH 4.00: 4.19 pH 7.00: 7.10 Temp: 14.25 EC: 12,880.	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N			
7/8/22	Stirling	YSI # 21G1053	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N 12,880µS/cm Y/N	12.3	pH 4.00: 4.19 pH 7.00: 7.08 Temp: 13.50 µS/cm EC: 10,709 µS/cm	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			

APPENDIX

E

DATA QUALITY REVIEW

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Data Quality Review
PFAS Ongoing Monitoring Plan
Q3 2022 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 6th and 8th September 2022 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HMAS Stirling, Cardno, August 2022, Rev7) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling* , NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP Q3 2022 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times were in compliance with required timeframes.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report, and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2211340, EP2211341, EP2211342, EP2211343, EP2211344, EP2211345, EP2211346, EP2211347, EP2211348, EP2211389, EP2211390, EP2211391, EP2211393, EP2211400, EP2211401, EP2211402, EP2211495, EP2211496, EP2211497, EP2211498, EP2211499, EP2211535, EP2211611. ▪ Eurofins report: 920981

QA/QC Aspects	Evidence & Evaluation

Data Precision & Accuracy

QC sample Frequency

QC sample type	SAQP required frequency	Sample Collected
Blind duplicate	1 in 10 primary samples (10%)	7 for 61 groundwater samples (11.5%) 4 for 39 porewater samples (10.3%) 3 in 28 surface water samples (10.7%) 4 in 39 sediment samples (10.3%)
Interlab duplicate	1 in 10 primary samples (10%)	7 for 61 groundwater samples (11.5%) 4 for 39 porewater samples (10.3%) 3 in 28 surface water samples (10.7%) 4 in 39 sediment samples (10.3%)
Rinsate	1 per field crew per day	9 for 4 day (up to 3 field personnel/day) (100%)
Field Blank	1 per field crew per day	9 for 4 day (up to 3 field personnel/day) (100%)

The required QC frequency was achieved for all sample types.

RPD Acceptance criteria

Magnitude of Results	Acceptable RPD range
< 10 x LOR	No limits
10 – 20 LOR	0% - 50%
> 20 x LOR	0% - 20%

QC Testing – Blind Duplicates (Primary Lab)

Groundwater

- Primary Groundwater Samples Analysed: 61
- Blind Duplicate Samples Analysed: 7

All RPDs were within acceptance criteria with the following exceptions:

- QC114 (PFHxS – 52%%, Sum of PFOS and PFHxS – 47%). These exceedances are very minor and probably due to the low concentrations of analytes under review. Both results were of the same order of magnitude and above the HEPA (2020) drinking water guideline. This is not considered to have impacted the reliability of the dataset.

Porewater

- Primary porewater Samples Analysed: 39
- Blind Duplicate Samples Analysed: 4

All RPDs were within acceptance criteria.

Surface water

- Primary surface water Samples Analysed: 28
- Blind Duplicate Samples Analysed: 3

All RPDs were within acceptance criteria.

Sediment

- Primary Sediment Samples Analysed: 39
- Blind Duplicate Samples Analysed: 4

All RPDs were within acceptance criteria.

QA/QC Aspects	Evidence & Evaluation
QC Testing – Interlab Duplicates (Secondary Lab)	***Groundwater*** ▪ Primary Groundwater Samples Analysed: 61 ▪ Interlab Duplicate Samples Analysed: 7 All RPDs were within acceptance criteria with the following exceptions: ▪ QC201 (PFPeS – 68%, PFHxS – 28%, PFHpS – 65%, PFOS – 52%, PFHxA – 98%, PFHpA – 40%, PFOA – 45%, Sum of PFOS and PFHxS – 46%). ▪ QC214 (PFHxS – 23%, Sum of PFOS and PFHxS – 29%). ▪ QC216 (PFHxS – 27%, PFHpS – 54%, PFOS – 25%PFOA – 35%, Sum of PFOS and PFHxS – 27%). ▪ QC217 (PFHxS – 49%, Sum of PFOS and PFHxS – 44%). These RPDs differences are likely due to the difference or methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. In all cases, the primary sample reported higher concentrations than the duplicate sample therefore the results reported on are considered conservative. This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Porewater*** ▪ Primary porewater Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria. ***Surface water*** ▪ Primary surface water Samples Analysed: 28 ▪ Interlab Duplicate Samples Analysed: 3 All RPDs were within acceptance criteria: ***Sediment*** ▪ Primary sediment Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank results were within acceptable range. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2211340, EP2211341, EP2211343, EP2211344, EP2211345, EP2211347, EP2211401, EP2211496, EP2211535: - Samples ID: MW124, MW158, PW369, PW335, SW311, SW406, anonymous: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2211345: - Sample ID MW289: PFOS matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2211495, EP2211498, EP2211611: - Sample ID MW228, anonymous: Sulfate matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2211535: - Sample ID MW220: PFHxS, PFOS and PFHxA matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.

QA/QC Aspects	Evidence & Evaluation
	The following quality control samples frequency outliers were reported: ▪ EP2211343, EP2211347, EP2211389, EP2211495, EP2211498: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. ▪ EP2211389: - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per sampler when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.

APPENDIX

D

DATA ASSESSMENT

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		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	Date					
MW109	3/08/2017	20.5	7.51	2.01	673	96
MW109	16/12/2019	26.1	7.04	1.92	801	
MW109	30/03/2020	21.8	7.34	1.55	918	
MW109	15/07/2020	19.1	7.28	2.77	923	23.9
MW109	21/09/2020	19.2	7.97	2.18	1,434	-58
MW109	14/12/2020	22.3	7.4	0.73	1,620	-79.3
MW109	16/03/2021	22.4	7.44	0.32	1,173	-223.7
MW109	8/06/2021	20	7.52	3.03	497.6	
MW109	30/08/2021	20.1	7.36	2.41	842	37.5
MW109	16/11/2021	20.1	7.36	2.41	842	37.5
MW109	14/03/2022	25	7.67	1.32	1,510	143.2
MW109	7/06/2022	18	7.42	1.31	936	-172.2
MW109	5/09/2022	19.8	7.34	1.46	880	66.7
MW112	3/08/2017	21.2	7.56	4.45	441	78
MW112	8/01/2020	23.6	7.7	4.06	651	
MW112	30/03/2020	23.6	7.48	2.24	540	
MW112	15/07/2020	19.8	7.56	3.1	505	75.1
MW112	21/09/2020	20.5	7.73	3.48	699	-7.8
MW112	14/12/2020	21.9	7.52	1.76	653	-71.6
MW112	16/03/2021	23.2	7.63	1.65	534	116.7
MW112	8/06/2021	20	7.71	2.29	548.8	
MW112	30/08/2021	19.7	7.51	2.39	523.7	80.2
MW112	10/01/2022	21.2	7.55	1.23	562	134.7
MW112	14/03/2022	22.5	7.78	3.4	579	70
MW112	7/06/2022	19.8	7.64	1.23	485.5	119.2
MW112	5/09/2022	19.6	7.67	1.63	515.5	59.2
MW120	3/08/2017	20.3	7.56	0.71	599	-12
MW120	4/11/2019	21.4	7.45	2.31	595	
MW120	16/12/2019	22.4	7.5	3.78	700	
MW120	30/03/2020	23	7.52	2.58	608	
MW120	15/07/2020	19.1	7.54	2.04	464.1	60.8
MW120	14/12/2020	20.8	7.58	0.9	589	-49.9
MW120	16/03/2021	23.2	7.64	2.06	635	82.2
MW120	8/06/2021	19.6	7.7	1.08	633	
MW120	30/08/2021	19.7	7.5	2.26	639	74.6
MW120	16/11/2021	19.7	7.5	2.26	639	74.6
MW120	10/01/2022	21	7.58	1.9	644	140.4
MW120	14/03/2022	24.1	7.82	1.64	697	137
MW120	7/06/2022	19.7	7.52	1.29	632	110.1
MW120	5/09/2022	19.1	7.7	3.42	670	60.1
MW121	3/08/2017	20.4	7.64	7.01	498	102
MW121	5/11/2019	21.4	7.75	7.49	486.7	
MW121	16/12/2019	25.6	7.27	5.74	592	
MW121	30/03/2020	22.6	7.57	1.8	590	
MW121	15/07/2020	19.5	7.36	13.28	521	57.2
MW121	21/09/2020	21.4	7.55	5.38	751	54.6
MW121	14/12/2020	20	7.76	3.76	661	-12.4
MW121	16/03/2021	26	7.3	1.41	695	33.3
MW121	8/06/2021	18.5	7.68	4.7	806	
MW121	30/08/2021	20.3	7.72	5.72	733	87.4
MW121	15/11/2021	22.5	8.45	5.71	663	8.1
MW121	10/01/2022	20.8	7.87	5.16	505.5	135.7
MW121	14/03/2022	25.6	7.78	5.05	686	147.6
MW121	7/06/2022	19	7.72	5.15	763	68.3
MW121	5/09/2022	19	7.99	7.39	550.2	37.8
MW123	3/08/2017	19.5	7.49	4.64	492	95
MW123	16/12/2019	22.1	7.22	5.47	677	
MW123	14/12/2020	20.3	7.84	2.21	1,655	-125.8
MW123	16/03/2021	24.2	7.69	3.89	661	61.8
MW123	8/06/2021	18.6	7.42	1.84	820	
MW123	30/08/2021	19.6	7.38	1.74	770	-190.2
MW123	15/11/2021	21.7	7.22	1.16	893	-125.9
MW123	16/11/2021	19.6	7.38	1.74	770	-190.2
MW123	10/01/2022	20.9	7.34	1.27	858	171.7
MW123	14/03/2022	20.4	7.38	2.18	1,657	45.3
MW123	7/06/2022	17.7	7.4	0.44	1,971	-133.5
MW123	5/09/2022	19.5	7.59	0.52	1,460	-20.9
MW124	3/08/2017	17.8	7.17	0.04	27,400	-289
MW124	30/03/2020	21	7.14	4.29	39,913	
MW124	15/07/2020	15.6	7.04	6.09	40,089	7.05
MW124	22/09/2020	19.3	7.36	2.19	47,467	-82.3
MW124	14/12/2020	19.5	7.16	0.51	40,107	-188.3
MW124	15/03/2021	20.8	7.99	0.83	38,532	-262.9
MW124	8/06/2021	19	7.31	0.97	42,836	
MW124	30/08/2021	17	7.26	1.27	42,307	-226.3
MW124	16/11/2021	17	7.26	1.27	42,307	-226.3
MW124	10/01/2022	19.9	7.5	0.4	35,739	-303.8
MW124	14/03/2022	21.4	7.11	0.53	39,644	-247.3
MW124	7/06/2022	18.4	7.33	0.69	20,665	-186.7
MW124	5/09/2022	16.7	7.12	0.56	37,916	-314
MW125	3/08/2017	17.9	7.19	0.08	27,800	-309
MW125	30/03/2020	20.7	7.02	2.5	42,625	
MW125	15/07/2020	16.4	7.09	4.35	40,575	-171.3
MW125	22/09/2020	19.2	7.16	1.82	48,861	-154.5
MW125	14/12/2020	19.6	7.14	0.29	40,970	-187.9
MW125	15/03/2021	21.1	7.4	0.81	44,213	-199.4
MW125	8/06/2021	19	7.29	1.02	45,553	
MW125	30/08/2021	17.6	7.18	0.5	29,455	-205.3
MW125	16/11/2021	17.6	7.18	0.5	29,455	-205.3
MW125	10/01/2022	20.7	7.25	0.38	36,979	-266.6
MW125	14/03/2022	23.6	7.17	0.65	45,470	-305.3
MW125	7/06/2022	18.9	7.27	0.77	44,803	-245.8
MW125	5/09/2022	19	7.16	0.21	41,218	-347.7

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
MW126	**3/08/2017**	17.9	7.02	0.01	26,300	-313
MW126	**8/01/2020**	21.1	7.09	4.67	41,841	
MW126	**31/03/2020**	19.5	7.04	1.8	38,371	
MW126	**15/07/2020**	16.7	6.91	2.96	40,030	-234.8
MW126	**22/09/2020**	19.3	7.17	0.91	46,315	-162.3
MW126	**14/12/2020**	19.7	7.03	0.64	37,968	-217.1
MW126	**15/03/2021**	20.3	7.24	1.24	40,561	-254.2
MW126	**8/06/2021**	19.7	7.33	1.29	43,757	
MW126	**30/08/2021**	18.8	6.94	1.24	43,803	-217.3
MW126	**16/11/2021**	18.8	6.94	1.24	43,803	-217.3
MW126	**10/01/2022**	20.5	6.95	0.91	43,258	-297.2
MW126	**14/03/2022**	23.5	7.03	0.27	41,517	-320.3
MW126	**7/06/2022**	18.8	7.09	1.11	41,941	-250
MW126	**5/09/2022**	20.8	6.95	0.61	41,207	-344.4
MW127	**3/08/2017**	17.9	7.08	0.07	23,100	-298
MW127	**8/01/2020**	23.4	7.14	1.8	40,920	
MW127	**31/03/2020**	23	7.11	0.52	39,878	
MW127	**15/07/2020**	17.3	7.11	3.29	34,614	-222.5
MW127	**22/09/2020**	19.7	7.31	0.77	43,370	-158.7
MW127	**14/12/2020**	19.8	7.15	0.6	36,014	-210.3
MW127	**15/03/2021**	20.8	7.32	0.66	38,542	-264.4
MW127	**8/06/2021**	20.1	7.35	0.94	40,922	
MW127	**30/08/2021**	18.5	7.05	0.77	36,917	-216
MW127	**16/11/2021**	18.5	7.05	0.77	36,917	-216
MW127	**10/01/2022**	22	7.13	0.55	39,757	-275.9
MW127	**14/03/2022**	23.2	7.18	0.57	36,314	-286.3
MW127	**7/06/2022**	19.9	6.94	0.53	37,448	-251.1
MW127	**5/09/2022**	20.5	7.37	1.11	39,553	-325
MW128	**3/08/2017**	19.9	7.42	1.3	605	45
MW128	**7/06/2022**	17.6	7.28	0.38		-193.4
MW128	**5/09/2022**	17.8	7.42	3.55	866	-36.7
MW139	**1/08/2017**	18.3	7.55	1.17	396	17
MW139	**15/11/2019**	21.1	7.56	0.26	3,743	
MW139	**8/01/2020**	21.9	7.69	4.01	5,072	
MW139	**30/03/2020**	20.9	7.17	4.23	10,494	
MW139	**20/07/2020**	17.4		7.99	11,385	43.5
MW139	**22/09/2020**	20.5	7.51	3.36	13,544	12.5
MW139	**14/12/2020**	21	7.45	2.45	6,350	15.4
MW139	**16/03/2021**	23.2	7.47	11.4	4,339	64.7
MW139	**8/06/2021**	16.9	7.71	1.92	3,013	
MW139	**31/08/2021**	19.8	8.07	3.57	565	99.8
MW139	**18/11/2021**	19.7		0.97	4,228	12.9
MW139	**10/01/2022**	22.1	8.26	2.27	1,484	-7
MW139	**15/03/2022**	23.1	7.59	1.5	12,140	-142.8
MW139	**8/06/2022**	19.1	7.64	1.23	5,386	70.5
MW139	**5/09/2022**	17.6	7.9	2.34	839	86.6
MW141	**1/08/2017**	17	7.31	0.12	10,740	-259
MW141	**15/11/2019**	20	7.08	1.39	22,099	
MW141	**8/01/2020**	21.6	7.11	1.97	25,555	
MW141	**30/03/2020**	20.5	7.16	6.24	26,742	
MW141	**20/07/2020**	17.7		5.72	15,605	-4.2
MW141	**23/09/2020**	19.1	7.37	1.39	28,278	-32.6
MW141	**14/12/2020**	21.3	7.18	1.04	31,614	-180.8
MW141	**16/03/2021**	21.8	7.18	0.69	33,145	-246.1
MW141	**8/06/2021**	19	7.06	0.57	33,953	
MW141	**31/08/2021**	24.1	7.13	2.83	14,365	-161.8
MW141	**18/11/2021**	19.5	7.01	0.5	26,705	-239.9
MW141	**10/01/2022**	20.7	7.25	1.04	22,349	-177.6
MW141	**15/03/2022**	22.1	7.11	0.84	26,489	-82.3
MW141	**8/06/2022**	18.9	7	1.37	33,277	-219.5
MW141	**5/09/2022**	17.4	7.1	0.89	24,328	-203.8
MW142	**1/08/2017**	16.5	7.57	1.59	6,490	91
MW142	**15/11/2019**	21.2	7.19	0.16	28,355	
MW142	**8/01/2020**	21.5	7.2	2.55	24,002	
MW142	**30/03/2020**	21.4	6.93	1.69	24,703	
MW142	**20/07/2020**	17.7		1.74	16,821	1.3
MW142	**23/09/2020**	16.6	7.4	3.74	39,939	26
MW142	**14/12/2020**	19.3	7.27	1.89	38,842	-65.8
MW142	**16/03/2021**	23.9	7.28	0.84	41,270	-76.2
MW142	**8/06/2021**	18.7	7.34	2.63	37,490	
MW142	**30/08/2021**	18.3	7.74	2.18	25,163	-97.8
MW142	**10/01/2022**	20.7	7.24	2.2	28,910	-75.6
MW142	**15/03/2022**	22.1	7.24	2.27	34,445	47.4
MW142	**8/06/2022**	19.7	7.29	0.56	30,614	-142.5
MW142	**5/09/2022**	16.9	7.24	0.88	23,846	29.3
MW147	**1/08/2017**	19	7.15	0.11	8.31	-316
MW147	**20/07/2020**	17.6		5.38	13,855	-31.6
MW149	**1/08/2017**	15.1	7.41	2.49	19,530	114
MW149	**15/11/2019**	19.8	7.28	0.32	35,004	
MW149	**8/01/2020**	21.4	7.34	2.59	27,039	
MW149	**30/03/2020**	20.3	7.31	4.5	34,240	
MW149	**20/07/2020**	16.3		6.1	18,049	8.2
MW149	**23/09/2020**	13.7	7.62	6.23	42,411	141.1
MW149	**14/12/2020**	23.9	8.04	0.69	55,331	49.5
MW149	**16/03/2021**	20.8	7.39	9.5	53,451	73.1
MW149	**8/06/2021**	16.1	7.24	0.83	49,531	
MW149	**30/08/2021**	16	7.87	5.05	51,642	50.9
MW149	**18/11/2021**	23.6	7.4	2	45,923	-38
MW149	**10/01/2022**	20.2	7.65	1.71	41,460	-41.9
MW149	**15/03/2022**	22.6	7.66	2.09	52,750	-82.8
MW149	**8/06/2022**	18.1	7.72	2.07	44,848	-162.3
MW149	**5/09/2022**	15.2	7.69	3.94	44,742	44.9
MW158	**7/08/2017**	19.1	7.39	0.18	11,380	31
MW158	**1/11/2019**	20.5	7.11	0.5	13,583	
MW158	**31/03/2020**	21.3	7.24	1.34	13,069	

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
MW158	**21/07/2020**	17.1		6.06	10,131	41.6
MW158	**21/09/2020**	19.5	7.4	1.13	14,358	-85.8
MW158	**14/12/2020**	20.5	7.33	1.96	12,880	-103.8
MW158	**15/03/2021**	22.4	7.3	1.49	16,445	45.6
MW158	**10/06/2021**	21.1	7.76	1.93	14,380	
MW158	**30/08/2021**	19.7	7.25	2.51	13,576	101.4
MW158	**16/11/2021**	19.7	7.25	2.51	13,576	101.4
MW158	**15/03/2022**	21.9	7.19	1.18	15,124	62.8
MW158	**7/06/2022**	20.4	7.16	8.25	13,181	-92.6
MW158	**5/09/2022**	19.3	7.28	1.67	11,811	52.6
MW161	**7/08/2017**	19.8	7.38	0.55	3,460	114
MW161	**1/11/2019**	20.8	7.24	3.02	3,503	
MW161	**21/07/2020**	18.5		6.63	3,034	26.7
MW161	**21/09/2020**	19.4	7.3	1.43	4,048	44.6
MW161	**14/12/2020**	21.2	7.3	2.18	3,354	55.5
MW161	**15/03/2021**	22.3	7.45	1.94	3,843	56.4
MW161	**10/06/2021**	20.9	7.28	0.64	3,886	
MW161	**30/08/2021**	20.2	7.46	2.71	3,193	88.1
MW161	**15/11/2021**	22.3	7.54	1.91	3,453	10.3
MW161	**16/11/2021**	20.2	7.46	2.71	3,193	88.1
MW161	**10/01/2022**	21.3	7.53	2.82	3,518	-64.6
MW161	**15/03/2022**	22	7.34	1.1	3,893	54.5
MW161	**4/05/2022**	19.4	7.3	1.9	3,337	135.6
MW161	**7/06/2022**	20.4	7.29	8.31	3,175	-1.4
MW161	**5/09/2022**	19.9	7.54	3.74	3,152	17.3
MW166	**7/08/2017**	19	6.6	0.1	3,210	93
MW166	**1/11/2019**	21.9	7.21	1.59	3,547	
MW166	**1/04/2020**	18.3	7.24	2.53	4,328	
MW166	**21/07/2020**	17.4		4.1	3,556	29.7
MW166	**22/09/2020**	16.5	7.72	10.72	3,972	86.1
MW166	**14/12/2020**	19.8	7.33	1.36	3,668	-36.3
MW166	**15/03/2021**	26	7.41	1.74	5,043	28.8
MW166	**10/06/2021**	19.2	7.53	2.44	5,572	
MW166	**30/08/2021**	19.6	7.4	1.07	3,888	43.5
MW166	**15/11/2021**	21.7	7.55	2.94	3,820	11.7
MW166	**16/11/2021**	19.6	7.4	1.07	3,888	43.5
MW166	**10/01/2022**	21.5	7.37	2.13	3,798	-84.1
MW166	**15/03/2022**	20.8	7.36	1.31	4,681	56.7
MW166	**4/05/2022**	19	7.46	1.6	4,992	145.3
MW166	**7/06/2022**	19.2	7.34	8.84	3,170	-67.6
MW166	**5/09/2022**	19.1	7.41	1.16	3,797	43.3
MW171	**7/08/2017**	18.2	7.31	0.31	6,558	-276
MW171	**30/10/2019**	21.4	7.31	1.93	7,503	
MW171	**1/04/2020**	20.7	7.25	6.2	14,371	
MW171	**21/07/2020**	17.9		2.53	3,785	-44.2
MW171	**14/12/2020**	19.3	7.11	1.77	6,683	-219.2
MW171	**15/03/2021**	25.9	7.32	1.26	8,569	-226.5
MW171	**10/06/2021**	19.9		0.83	15,776	
MW171	**30/08/2021**	19.6	7.3	2.14	10,080	-117.4
MW171	**15/11/2021**	21.9	7.47	0.74	6,690	-9.8
MW171	**16/11/2021**	19.6	7.3	2.14	10,080	-117.4
MW171	**10/01/2022**	20.9	7.31	0.88	13,570	67
MW171	**15/03/2022**	21.4	7.36	0.59	13,905	-212.7
MW171	**4/05/2022**	21.3	7.14	0.7	17,398	-19.2
MW171	**7/06/2022**	19.9	7.16	16.23	12,891	-205.3
MW171	**5/09/2022**	18.8	7.32	4.88	14,325	71.3
MW172	**7/08/2017**	18.1	7.11	0.12	11,080	-126
MW172	**8/06/2022**	16.9	7.39	0.66		88.1
MW172	**6/09/2022**	16.4	7.42	3.99	3,777	-156.3
MW173	**9/08/2017**	19.2	7.36	0.16	5,690	-138
MW173	**15/11/2019**	22.6	7.56	10.41	4,505	
MW173	**31/03/2020**	23	7.16	1.82	7,064	
MW173	**22/07/2020**	20.2	7.59	5.35	3,765	-201
MW173	**16/03/2021**	24.6	7.53	1.5	3,586	-1,900
MW173	**10/06/2021**	21.8	7.23	0.53	4,549	
MW173	**15/11/2021**	21.6	7.18	0.8	2,657	-43
MW173	**15/03/2022**	24.6	7.37	1.85	3,686	57.9
MW173	**4/05/2022**	20.1	7.29	1	4,335	0.3
MW173	**8/06/2022**	19.6	7.31	1.43	4,602	-164.6
MW173	**5/09/2022**	20.1	7.63	7.69	3,927	-28.1
MW193	**8/08/2017**	19.7	7.34	0.17	3,330	191
MW193	**28/10/2019**	20.7	6.92	0.61	3,023	
MW193	**8/01/2020**	20.5	6.97	1.52	3,789	
MW193	**31/03/2020**	22.5	7.24	2.47	4,411	
MW193	**15/07/2020**	19	7.39	5.88	3,925	-49.2
MW193	**16/12/2020**	21.4	7.08	1.42	3,257	-116.7
MW193	**16/03/2021**	26.8	7.23	1.14	3,820	-119
MW193	**10/06/2021**	20.7	7.63	0.23	3,135	
MW193	**30/08/2021**	19.1	7.33	1.89	3,759	-86.2
MW193	**16/11/2021**	19.1	7.33	1.89	3,759	-86.2
MW193	**10/01/2022**	22.7	7.2	1.08	3,540	-132.8
MW193	**15/03/2022**	22.3	7.48	1.38	4,066	-53
MW193	**7/06/2022**	19.3	7.2	2.52	4,079	-286.6
MW193	**5/09/2022**	20.2	7.37	1.09	3,201	-237.7
MW195D	**9/08/2017**	19	7.42	0.01	21,260	-169
MW195D	**28/10/2019**	20.7	7.27	0.66	26,949	
MW195D	**8/01/2020**	20.5	7.9	4.52	17,425	
MW195D	**31/03/2020**	21.9	7.47	0.44	25,679	
MW195D	**15/07/2020**	19.9	7.68	0.81	17,155	-52.7
MW195D	**21/09/2020**	20.3	7.18	0.73	35,243	37.3
MW195D	**16/12/2020**	21.2	7.43	1.25	34,195	-96.6
MW195D	**16/03/2021**	23.5	7.5	0.72	30,467	-135
MW195D	**9/06/2021**	17.4	8	2.91	26,805	
MW195D	**30/08/2021**	19.6	7.5	0.97	30,466	-94.9
MW195D	**15/11/2021**	23.1	7.29	1.42	27,836	-38.3

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	Date					
MW195D	16/11/2021	19.6	7.5	0.97	30,466	-94.9
MW195D	10/01/2022	21.9	7.53	0.96	31,589	-134.9
MW195D	15/03/2022	22.5	6.79	0.71	32,683	-104.5
MW195D	4/05/2022	19.4	7.26	0.6	26,279	31
MW195D	7/06/2022	19.7	7.28	11.71	32,780	-76.2
MW195D	5/09/2022	19.2	7.35	7.54	23,420	0.5
MW195S	9/08/2017	19.7	7.16	0.01	1,724	-242
MW195S	8/01/2020	21.2	7.24	3.17	4,526	
MW195S	31/03/2020	21.8	7.36	2.52	4,976	
MW195S	15/07/2020	19.7	7.35	1.39	4,189	33.3
MW195S	21/09/2020	20.4	7.06	0.38	9,189	-8
MW195S	16/12/2020	21.2	7.31	3.05	4,742	-30.2
MW195S	16/03/2021	25.9	7.28	2.85	5,102	-38.5
MW195S	9/06/2021	18.9	7.78	2.54	5,810	
MW195S	30/08/2021	19.9	7.32	1.88	5,972	1
MW195S	16/11/2021	19.9	7.32	1.88	5,972	1
MW195S	10/01/2022	22.6	7.37	1.66	4,745	1.9
MW195S	15/03/2022	22	7.14	0.95	5,711	71.5
MW195S	7/06/2022	20.9	7.21	17.16	5,194	-15
MW195S	5/09/2022	19.7	7.25	1.31	5,351	29
MW196	8/08/2017	20	7.22	3.26	548	63
MW196	29/10/2019	21.5	7.57	3.48	622	
MW196	2/04/2020	21.2	7.75	7.13	632	
MW196	22/07/2020	20.4	7.71	5.29	876	-109.1
MW196	24/09/2020	18.6	7.78	7.38	746	35.3
MW196	16/12/2020	20.6	7.64	2.26	614	-15.1
MW196	10/06/2021	20.8	8.32	4.27	690	
MW196	30/08/2021	20.8	8.1	4.68	652	-148.7
MW196	16/11/2021	20.8	8.1	4.68	652	-148.7
MW196	14/03/2022	22.9	7.93	4.09	620	131.1
MW196	6/09/2022	20.7	7.73	4.19	605	125.4
MW197	9/08/2017	16.9	7.17	0.06	7,350	116
MW197	31/03/2020	22	7.55	1.35	4,865	
MW197	16/03/2021	23.5	7.61	2.95	7,341	4.5
MW197	9/06/2021	18.5	8.05	2.84	7,000	
MW197	1/09/2021	19.3	7.68	2.78	7,303	15.6
MW197	7/06/2022	19.5	7.23	6.1	4,164	1.9
MW197	5/09/2022	18.2	7.43	2.5	3,358	91.1
MW199	8/08/2017	20.4	7.44	0.16	15,950	-111
MW199	29/10/2019	21	7.09	0.22	24,015	
MW199	8/01/2020	21.3	7.81	9.07	70.6	
MW199	31/03/2020	23.4	7.21	3.68	21,776	
MW199	15/07/2020	19	7.69	3.59	3,345	106.1
MW199	21/09/2020	19.7	7.16	2.9	21,776	-202.3
MW199	16/12/2020	22	7.54	2.31	4,121	-24.5
MW199	30/08/2021	20.5	7.67	3.16	1,292	-154.4
MW199	16/11/2021	20.5	7.67	3.16	1,292	-154.4
MW199	10/01/2022	22.5	7.48	2.28	14,294	-120.4
MW199	17/03/2022	21.2	7.01	2.13	8,752	118.3
MW199	7/06/2022	20	7.27	8.77	11,349	42.3
MW199	5/09/2022	20.5	7.52	4.39	6,473	42.8
MW200	9/08/2017	17.8	7.16	0.92	6,960	147
MW200	11/11/2019	20.3	7.13	0.18	2,089	
MW200	31/03/2020	23.6	7.73	1.48	5,697	
MW200	15/07/2020	17.7	7.42	10.57	8,090	-49.5
MW200	24/09/2020	20.8	8.06	4.97	9,988	17.1
MW200	15/12/2020	23.9	7.66	3.15	8,837	-92.1
MW200	16/03/2021	26.2	7.41	2.16	11,389	23.5
MW200	9/06/2021	18.5	7.99	3.9	9,354	
MW200	1/09/2021	18.1	7.89	2.32	7,822	44.1
MW200	16/11/2021	19.6	7.64	0.39	6,524	-35.2
MW200	10/01/2022	22.5	7.79	2.32	7,646	-34.7
MW200	14/03/2022	24.8	7.59	1.72	10,507	-77.9
MW200	5/05/2022	22.6	7.14	0.4	10,637	126.1
MW200	7/06/2022	20.2	7.61	8.39	10,280	57.4
MW200	5/09/2022	18.9	7.81	6.75	7,487	42.7
MW202	9/08/2017	18.4	7.38	0.19	1,656	-149
MW202	31/03/2020	22.9	8.01	1.64	1,350	
MW202	22/07/2020	17.6	7.69	4.37	1,985	6.5
MW202	21/09/2020	17.7	7.48	2.24	981	111.3
MW202	16/12/2020	21.5	7.54	1.64	1,209	-14.5
MW202	15/03/2021	21.4	7.7	8.8	1,487	86.8
MW202	10/06/2021	21.1	7.57	1.08	2,432	
MW202	30/08/2021	19.2	7.6	2.16	1,493	-127.5
MW202	16/11/2021	19.2	7.6	2.16	1,493	-127.5
MW202	12/01/2022	23.3	7.47	1.53	1,374	45.3
MW202	8/06/2022	18	7.76	1.42		56
MW202	5/09/2022	19.1	7.56	4.12	3,310	-194.7
MW203	9/08/2017	16.3	7.5	0.96	1,386	53
MW203	8/11/2019	22.2	7.54	3.51	1,511	
MW203	31/03/2020	22.8	7.59	1.3	1,369	
MW203	15/07/2020	19.4	7.77	1.84	1,314	72.6
MW203	22/09/2020	18.1	7.44	3.17	822	111.1
MW203	16/12/2020	22.2	7.61	1.78	985	-18.8
MW203	16/03/2021	23.8	7.89	1.97	1,013	21
MW203	9/06/2021	18.9	8.09	3.38	1,010	
MW203	30/08/2021	21	7.81	5.44	835	-141.6
MW203	16/11/2021	21	7.81	5.44	835	-141.6
MW203	10/01/2022	21.9	7.68	1.51	2,421	-76.5
MW203	17/03/2022	22.2	7.62	2.08	1,100	-39.5
MW203	7/06/2022	20.6	7.91	3.02	995	-4.5
MW203	6/09/2022	18.8	7.79	1.74	957	-63.3
MW214	2/08/2017	17.1	7.4	4.56	1,574	127
MW214	1/09/2021	18.2	7.28	3.88	2,914	-138.8
MW214	16/11/2021	18.2	7.28	3.88	2,914	-138.8

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
MW214	**7/06/2022**	13.1	7.05	1.51		-93.6
MW214	**6/09/2022**	16.5	7.04	3.82	2,212	-46.7
MW215	**2/08/2017**	18	7.62	2.38	901	113
MW215	**1/09/2021**	18.9	8.15	1.7	1,446	-26.2
MW215	**7/06/2022**	17.2	7.46	1.72		-51.5
MW215	**6/09/2022**	16.4	7.56	3.66	1,293	-30.8
MW216	**2/08/2017**	16.6	7.61	1.31	906	68
MW216	**19/12/2019**	18.6	7.53	3.95	1,142	
MW216	**31/03/2020**	20	7.27	7.38	1,479	
MW216	**22/07/2020**	19.6	7.39	4.81	1,304	25.4
MW216	**15/12/2020**	20.9	7.25	2.02	1,592	0.6
MW216	**18/03/2021**	21	7.52	2.26	1,753	118.1
MW216	**9/06/2021**	18.4	7.78	3.69	1,753	
MW216	**31/08/2021**	22	7.73	3.77	2,545	7.6
MW216	**16/03/2022**	20.1	7.17	3	2,296	-41.7
MW216	**7/06/2022**	15.6	7.41	1.09		-20.1
MW216	**5/09/2022**	18.2	7.53	4.39	2,104	12
MW217	**2/08/2017**	18.7	7.42	5.34	731	120
MW217	**18/12/2019**	21.7	7.23	4.8	332.1	
MW217	**31/03/2020**	23.5	8.04	6.59	483.2	
MW217	**22/07/2020**	22.8	7.62	5.86	637	-18.3
MW217	**24/09/2020**	21.7	8.08	7.29	2,381	99.3
MW217	**15/12/2020**	21.8	7.72	4.4	504	-7.8
MW217	**18/03/2021**	22.5	7.58	4.33	958	61.4
MW217	**9/06/2021**	19.3	8.12	6.87	733	
MW217	**31/08/2021**	20.1	7.57	5.62	1,170	-118.9
MW217	**16/11/2021**	20.1	7.57	5.62	1,170	-118.9
MW217	**18/11/2021**	20.7	7.48	6.14	945	12.5
MW217	**13/01/2022**	21.5	7	2.16	1,005	105.8
MW217	**17/03/2022**	22.2	7.62	6.59	957	-11.3
MW217	**8/06/2022**	17.3	7.65	1.43		79.2
MW217	**8/09/2022**	17.8	7.53	5.52	1,122	-43.3
MW220	**2/08/2017**	17.2	7.11	4	1,621	145
MW220	**13/01/2022**	20.2	7.34	2.69	993	87.1
MW220	**8/06/2022**	18.7	7.69	1.21		109.5
MW220	**8/09/2022**	15.2	7.52	4.98	815	34.6
MW224	**9/08/2017**	18.2	7.74	3.61	763	69
MW224	**18/12/2019**	21.9	7.66	7.9	427.3	
MW224	**31/03/2020**	20	7.22	5.75	794	
MW224	**22/07/2020**	20	7.65	5.15	826	10
MW224	**24/09/2020**	19.3	8.06	5.74	1,788	103.4
MW224	**15/12/2020**	21	7.73	4.66	835	-6.8
MW224	**18/03/2021**	21.1	7.84	4.49	894	65.1
MW224	**9/06/2021**	18.5	8.04	6.51	860	
MW224	**31/08/2021**	19.1	7.7	6.18	905	-11,105
MW224	**16/11/2021**	19.1	7.7	6.18	905	-11,105
MW224	**13/01/2022**	20.9	7.64	3.71	900	85.9
MW224	**17/03/2022**	21.3	7.96	7.03	857	17.5
MW224	**8/06/2022**	17.1	7.73	1.13		120
MW224	**8/09/2022**	18.3	7.81	7.54	814	-89.5
MW225	**2/08/2017**	18.6	7.45	1.82	1,289	48
MW225	**1/09/2021**	18.2	7.6	2.26	2,008	-163.9
MW225	**16/11/2021**	18.2	7.6	2.26	2,008	-163.9
MW225	**16/03/2022**	20.4	7.62	1.34	2,872	-194.3
MW225	**7/06/2022**	18.8	7.43	0.86		-216.5
MW225	**6/09/2022**	15.5	7.5	4.42	1,548	5.6
MW226	**2/08/2017**	18.5	7.15	0.19	23,200	41
MW226	**14/01/2020**	25.4	7.17	6.15	43,562	
MW226	**2/04/2020**	22.2	6.92	5.29	40,885	
MW226	**21/07/2020**	18.7	7.11	12.22	37,338	-22.5
MW226	**22/09/2020**	19.3	7.26	2.26	42,211	53
MW226	**15/12/2020**	21.9	7.1	1.02	43,297	-40.2
MW226	**17/03/2021**	23.2	7.09	1	44,123	-121.6
MW226	**10/06/2021**	20.8	7.16	0.9	43,023	
MW226	**31/08/2021**	19.7	7.52	2.42	43,481	-197.1
MW226	**16/03/2022**	23.9	7.11	0.66	43,451	-168.5
MW226	**7/06/2022**	19.1	7.16	0.75		-99.4
MW226	**6/09/2022**	18.2	7.08	0.72	38,453	-191.7
MW227	**2/08/2017**	18	7.37	0.43	3.39	-169
MW227	**1/04/2020**	23.2	7.32	0.51	4,461	
MW227	**22/07/2020**	17.6		4.38	3,530	-6.2
MW227	**21/09/2020**	20.8	7.7	2.9	8,134	-205.8
MW227	**15/12/2020**	21	7.38	1.1	3,487	-100.6
MW227	**15/03/2021**	21.6	7.92	0.61	5,808	-161.2
MW227	**10/06/2021**	20.3	7.6	1.94	3,101	
MW227	**31/08/2021**	19.3	8.03	1.57	4,600	-135.6
MW227	**14/01/2022**	21.5	7.59	0.73	5,867	-62.4
MW227	**16/03/2022**	22.8	7.49	0.47	7,043	-197.1
MW227	**7/06/2022**	17.5	7.39	0.25		-220.5
MW227	**7/09/2022**	17.8	7.19	2.66	4,064	-62.1
MW228	**2/08/2017**	18.6	7.3	0.67	18,390	28
MW228	**14/01/2020**	25.8	7.49	5.48	24,107	
MW228	**1/04/2020**	23.8	7.26	1.15	28,530	
MW228	**22/07/2020**	18.2		2.2	15,397	11
MW228	**21/09/2020**	19.9	7.22	2.25	31,898	-210.6
MW228	**15/12/2020**	20	7.2	0.89	29,607	-69.7
MW228	**15/03/2021**	23.3	7.27	0.57	28,133	-11,952
MW228	**10/06/2021**	20.7	7.38	0.72	34,475	
MW228	**31/08/2021**	20.3	7.49	0.72	24,402	-64.5
MW228	**14/01/2022**	22.2	7.28	0.31	19,836	-243.4
MW228	**16/03/2022**	23.1	7.5	1.79	16,409	-161.7
MW228	**7/06/2022**	19.8	7.6	1.6	73,403	-136
MW228	**7/09/2022**	16.3	7.48	1.7	10,013	152.1
MW233	**8/08/2017**	17	7.49	0.06	312	-210
MW233	**12/11/2019**	16.6	7.64	0.12	354.2	

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	Date					
MW233	30/03/2020	17.6	8.12	3.1	344	
MW233	15/07/2020	16.5	8.28	2.55	272.4	80.2
MW233	21/09/2020	15.7	7.6	2.99	443.9	30.6
MW233	15/12/2020	17.3	8.28	1.65	396.8	-118.8
MW233	15/03/2021	18.9	8.51	20.4	695	-167.4
MW233	9/06/2021	15.7	7.82	2.03	419.5	
MW233	30/08/2021	15.6	8.39	2.1	442.6	190.6
MW233	8/11/2021	18.1	7.98	2.06	378.6	-90.1
MW233	10/01/2022	20.6	8.51	3.59	483.6	-73.1
MW233	17/03/2022	18.8	8.5	3.32	342.1	-114.5
MW233	3/05/2022	18.2	7.8	0.6	385.4	-11.1
MW233	8/06/2022	16.7	7.91	2.27	242.6	-83
MW233	6/09/2022	14.7	8.66	4.62	824	-33.1
MW236	8/08/2017	20.3	7.38	2.25	622	222
MW236	11/10/2019	20.7	7.36	1.92	578	
MW236	2/04/2020	22.4	7.62	5.92	579	
MW236	16/07/2020	18.9	8.01	2.8	969	-10.9
MW236	21/09/2020	16.8	7.65	3.98	574	-2.4
MW236	15/12/2020	21	7.61	3.19	616	7.5
MW236	16/03/2021	24.2	7.5	2.59	776	97.6
MW236	10/06/2021	21.9	8.33	4.12	726	
MW236	31/08/2021	18.5	7.57	4.77	776	69.9
MW236	8/11/2021	19.9	7.53	3.76	882	-10.1
MW236	16/11/2021	18.5	7.57	4.77	776	69.9
MW236	10/01/2022	23.6	7.66	2.94	816	49.9
MW236	3/05/2022	20.3	7.36	4	709	92.3
MW236	7/06/2022	19.5	7.71	3.29	632	24.7
MW236	6/09/2022	18.1	7.85	5.38	670	4.6
MW238	4/08/2017	19.9	7.6	2.86	525	140
MW238	21/10/2019	20.8	7.55	4.56	553	
MW238	14/01/2020	24.2	8.44	19.95	985	
MW238	1/04/2020	21.3	7.48	1.3	696	
MW238	16/07/2020	19.8	7.85	2.69	776	18.2
MW238	21/09/2020	18.1	7.74	4.64	616	31.5
MW238	30/09/2020	20.5	7.7	2.64	674	97.3
MW238	15/12/2020	22	7.65	1.51	656	-9.2
MW238	15/02/2021	23.6	7.39	46	639	104.9
MW238	18/03/2021	21.3	7.74	1.31	728	2.8
MW238	10/06/2021	21.3	8.44	2.58	779	
MW238	31/08/2021	20.4	7.81	4.26	665	75.4
MW238	16/11/2021	20.4	7.81	4.26	665	75.4
MW238	12/01/2022	21.8	7.64	2.28	725	108.5
MW238	9/06/2022	19.8	7.84	1.93	679	-2.5
MW238	6/09/2022	18.2	7.83	4.37	636	76.5
MW239	4/08/2017	19.8	7.42	1.65	561	-98
MW239	18/10/2019	20.6	7.48	5.07	564	
MW239	22/07/2020	17.8		6.11	18,786	16.3
MW239	21/09/2020	16.7	7.79	5.38	561	38.5
MW239	1/10/2020	20.1	7.85	1.87	618	51.2
MW239	15/12/2020	21.3	7.6	1.03	635	9
MW239	15/02/2021	23.6	7.21	20.9	655	101.3
MW239	18/03/2021	22.8	7.83	1.44	709	96
MW239	10/06/2021	21	7.59	1.22	696	
MW239	31/08/2021	20.5	7.84	5.22	581	72.3
MW239	9/11/2021	22.8	7.68	2.81	710	-127.3
MW239	16/11/2021	20.5	7.84	5.22	581	72.3
MW239	12/01/2022	21.2	7.75	4.52	476.1	105.6
MW239	3/05/2022	20	7.32	1	767	166.1
MW239	9/06/2022	19.9	7.79	3.61	643	1.3
MW239	6/09/2022	17.5	7.83	5.45	632	69.2
MW240	4/08/2017	21	7.23	0.73	695	140
MW240	21/10/2019	21.8	7.25	1.14	779	
MW240	14/01/2020	27.4	7.51	19.11	1,112	
MW240	1/04/2020	23	7.51	4.01	888	
MW240	16/07/2020	20.3	7.65	1.57	888	15.6
MW240	21/09/2020	18.2	7.4	1.76	755	18.8
MW240	30/09/2020	21.4	7.43	1.76	826	87.3
MW240	15/12/2020	22.6	7.43	1.43	796	-14.1
MW240	15/02/2021	23.5	7.36	0.67	960	124.7
MW240	18/03/2021	23.7	7.75	2.49	964	86.9
MW240	10/06/2021	21.4	8.28	1.5	942	
MW240	31/08/2021	21.4	7.5	2.92	834	81.3
MW240	16/11/2021	21.4	7.5	2.92	834	81.3
MW240	12/01/2022	23	7.41	2.07	863	99.9
MW240	9/06/2022	20.2	7.64	2.34	897	
MW240	6/09/2022	19.5	7.51	2.35	775	83.2
MW242	7/08/2017	21.9	7.65	1.57	579	30
MW242	18/10/2019	21.7	7.57	0.63	508	
MW242	30/03/2020	21.2	7.98	1.39	493.2	
MW242	16/07/2020	21.5	7.88	2.34	462.6	23.7
MW242	21/09/2020	19	7.68	2.77	538	-2.6
MW242	1/10/2020	22.5	7.63	1.03	609	73.8
MW242	15/12/2020	23.3	7.68	0.71	653	-12.9
MW242	16/02/2021	25	7.13	0.43	604	132.2
MW242	18/03/2021	23.6	7.42	2.43	36,676	39
MW242	9/06/2021	20.8	7.81	2.48	312.4	
MW242	31/08/2021	21.8	7.71	3.52	901	84
MW242	9/11/2021	22.8	7.6	1.22	704	-9.3
MW242	12/01/2022	25.3	8.01	0.87	1,508	-105.4
MW242	17/03/2022	24.2	7.89	1.49	477.1	-73.6
MW242	3/05/2022	22	7.72	0.7	554	123.3
MW242	8/06/2022	22	7.9	1.65	518.1	-25
MW242	6/09/2022	17.8	7.86	3.18	700	59.4
MW243	24/10/2019	20.7	7.49	0.24	701	
MW243	14/01/2020	23.4	7.62	5.55	450.5	

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
MW243	**1/04/2020**	21.2	7.51	4	766	
MW243	**16/07/2020**	19.9	7.74	3.25	868	14.8
MW243	**21/09/2020**	17.8	7.58	3.21	704	19.4
MW243	**30/09/2020**	20.4	7.53	1.17	775	69.5
MW243	**15/12/2020**	22.4	7.58	1.65	825	-9.2
MW243	**15/02/2021**	21.6	7.46	0.55	917	70.3
MW243	**18/03/2021**	21.7	7.73	2.29	1,931	-5.1
MW243	**10/06/2021**	20.2	7.65	3	825	
MW243	**31/08/2021**	19.9	7.64	2.86	800	80.6
MW243	**9/11/2021**	19.8	7.54	1.85	959	-140.8
MW243	**16/11/2021**	19.9	7.64	2.86	800	80.6
MW243	**12/01/2022**	22.3	7.1	2.06	1,026	109.5
MW243	**3/05/2022**	19.3	6.19	1.7	1,171	174.2
MW243	**9/06/2022**	17.9	7.74	3.07	908	-3.4
MW243	**6/09/2022**	17.4	7.62	2.31	916	68
MW245	**4/08/2017**	19.3	6.83	0.05	768	-185
MW245	**21/10/2019**	20.3	6.9	0.13	722	
MW245	**14/01/2020**	23.4	7.28	4.07	3,863	
MW245	**1/04/2020**	21.5	7.07	1.63	900	
MW245	**16/07/2020**	19.9	7.15	2.25	1,238	-0.5
MW245	**21/09/2020**	18.1	7.05	2.21	916	26.2
MW245	**30/09/2020**	20.3	7.09	1.12	987	-97.5
MW245	**15/12/2020**	21.3	7.36	1.67	914	-90.4
MW245	**15/02/2021**	22.6	6.95	0.01	1,018	-162.7
MW245	**18/03/2021**	21.9	7.11	2.11	879	-129.4
MW245	**10/06/2021**	21.8	7.36	0.88	1,155	
MW245	**31/08/2021**	18.8	7.4	1.67	705	69.5
MW245	**9/11/2021**	21.1	7.42	0.64	746	-74.6
MW245	**16/11/2021**	18.8	7.4	1.67	705	69.5
MW245	**12/01/2022**	21.2	7.26	1.81	754	-47.7
MW245	**3/05/2022**	21	7.26	0.9	839	76.4
MW245	**9/06/2022**	18	7.28	2.69	876	-101.7
MW245	**6/09/2022**	15.1	7.29	0.85	723	46.2
MW249	**7/08/2017**	21.7	7.34	-0.01	1,775	-200
MW249	**15/11/2019**	23.8	7.13	0.12	1,354	
MW249	**30/03/2020**	21.2	7.51	2.63	998	
MW249	**16/07/2020**	20.8	7.63	1.86	1,308	-11.3
MW249	**21/09/2020**	18.5	7.43	2.7	1,198	68
MW249	**1/10/2020**	22.2	7.3	0.15	1,365	-154.2
MW249	**15/12/2020**	22.8	7.33	0.9	1,098	-72.4
MW249	**16/02/2021**	22.5	7.27	0.29	1,268	-149.1
MW249	**15/03/2021**	22.6	7.5	6.2	1,305	-197.2
MW249	**9/06/2021**	19.2	7.32	0.94	1,243	
MW249	**31/08/2021**	19.9	7.67	2.56	1,303	82.6
MW249	**12/01/2022**	25.2	7.43	2.09	1,256	-24.2
MW249	**17/03/2022**	22.5	7.47	0.92	1,175	-178.8
MW249	**8/06/2022**	21.6	7.49	0.77	1,239	-149.6
MW249	**6/09/2022**	18.7	7.42	2.88	1,209	48.5
MW255	**4/08/2017**	18.9	7.37	3.3	862	72
MW255	**16/07/2020**	19.9	7.69	2.76	1,086	769
MW255	**22/09/2020**	18.8	7.37	2.95	932	75
MW255	**16/12/2020**	23	0.34	3.72	662	-17.5
MW255	**17/03/2021**	24.3	7.64	0.96	1,847	-80
MW255	**10/06/2021**	20.3	7.89	0.99	968	
MW255	**31/08/2021**	20.2	7.45	2.21	928	-31.7
MW255	**16/11/2021**	20.2	7.45	2.21	928	-31.7
MW255	**10/01/2022**	22	7.62	0.84	786	70.4
MW255	**17/03/2022**	22.8	7.72	0.85	808	-173.5
MW255	**9/06/2022**	19.6	7.74	1.37	816	-70.8
MW255	**6/09/2022**	18.4	7.56	1.04	878	-58.7
MW256	**4/08/2017**	18.3	7.29	3.03	591	41
MW256	**30/03/2020**	20.7	7.71	1.06	2,443	
MW256	**16/07/2020**	19.1	7.49	1.75	1,197	-52.3
MW256	**22/09/2020**	17.9	7.19	1.95	868	86.2
MW256	**14/12/2020**	20.5	7.25	2.17	1,203	82.9
MW256	**17/03/2021**	21.9	7.33	1.24	1,955	-116.6
MW256	**10/06/2021**	20	7.02	0.9	1,471	
MW256	**31/08/2021**	19.7	7.37	1.86	1,477	-175.5
MW256	**16/11/2021**	19.7	7.37	1.86	1,477	-175.5
MW256	**10/01/2022**	22.2	7.03	0.83	1,610	49.9
MW256	**17/03/2022**	21	7.2	0.72	3,737	-248.2
MW256	**9/06/2022**	18.9	7.25	1.19	1,261	-179.8
MW256	**6/09/2022**	17.8	7.13	0.7	1,858	-190.7
MW257	**4/08/2017**	18.3	7.69	8	373	96
MW257	**19/12/2019**	19.8	7.91	5.32	473.3	
MW257	**2/04/2020**	21.8	7.66	5.69	539	
MW257	**16/07/2020**	18.8	8.27	6.56	335.4	10
MW257	**22/09/2020**	18.5	7.96	6.33	365.8	76.3
MW257	**16/12/2020**	23.3	7.8	5.24	3,116	18.5
MW257	**18/03/2021**	22.2	7.78	5.14	579	74.9
MW257	**9/06/2021**	17.8	8.15	5.5	491	
MW257	**31/08/2021**	18.8	8.19	6.51	328.8	56.8
MW257	**16/11/2021**	18.8	8.19	6.51	328.8	56.8
MW257	**10/01/2022**	21.4	7.81	4.81	565	74.3
MW257	**17/03/2022**	22.1	7.77	1.96	521	-48
MW257	**9/06/2022**	19.3	8.08	6.22	358.2	-18.6
MW257	**6/09/2022**	17.7	8.25	6.87	357	-1.4
MW258	**4/08/2017**	20.6	7.28	0.24	931	92
MW258	**8/06/2022**	20.5	7.84	3.21		110.5
MW258	**6/09/2022**	19.2	7.36	1.7	1,153	31.8
MW259	**4/08/2017**	17.8	7.38	0.076	444	53
MW259	**16/07/2020**	19.4	7.84	3.28	432.5	13.1
MW259	**22/09/2020**	18.5	7.48	3.82	529	94.9
MW259	**16/12/2020**	21.3	7.37	1.97	3,068	38.7
MW259	**18/03/2021**	21.3	7.42	2.66	36,564	76.4

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
MW259	**10/06/2021**	19.7	8.13	2.79	715	
MW259	**31/08/2021**	18.2	7.39	3.82	533.5	85.8
MW259	**16/11/2021**	18.2	7.39	3.82	533.5	85.8
MW259	**11/01/2022**	22.8	7.76	2.31	1,503	44.3
MW259	**17/03/2022**	20.7	7.83	2.36	638	-76.6
MW259	**9/06/2022**	18	7.91	2.64	389.3	3.3
MW259	**6/09/2022**	17.6	7.54	2.95	482.6	129.1
MW261	**4/08/2017**	18.7	7.22	0.04	816	-260
MW261	**26/09/2019**	20.8	7.18	0.03	1.82	-248
MW261	**25/10/2019**	21.1	7.12	0.09	2,120	
MW261	**2/12/2019**	19.5	7.27	0.32	2.96	-216
MW261	**19/12/2019**	21.3	7.25	1.56	1,335	
MW261	**17/03/2020**	21.3	7.27	0.06	2.95	-212
MW261	**30/03/2020**	22	7.4	1.52	2,643	
MW261	**9/06/2020**	21.4	7.44	0.05	2.92	-287
MW261	**21/07/2020**	19.7	7.37	3.28	2,708	-173.3
MW261	**22/09/2020**	19.3	7.34	2.46	2,287	-61.2
MW261	**6/10/2020**	20.8	7.12	0.14	2,324	-306.5
MW261	**16/12/2020**	20	7.39	1.54	2,637	-17.1
MW261	**22/02/2021**	22.5	6.94	0	2,555	-325
MW261	**18/03/2021**	21.5	7.26	0.69	2,965	-143.3
MW261	**9/06/2021**	17.9	7.48	1.31	2,886	
MW261	**31/08/2021**	20.8	7.34	1.8	1,964	-217.7
MW261	**8/11/2021**	21.2	7.87	0.75	2,311	-32.1
MW261	**16/11/2021**	20.8	7.34	1.8	1,964	-217.7
MW261	**11/01/2022**	26.1	7.51	1.75	1,636	-216
MW261	**17/03/2022**	22.5	7.49	1.18	1,398	-109.6
MW268	**1/08/2017**	19.5	7.3	0.13	7,750	-112
MW268	**12/11/2019**	21.9	7.15	0.09	4,672	
MW268	**19/12/2019**	19.3	7.07	3.85	4,279	
MW268	**30/03/2020**	22.2	7.35	1.87	5,341	
MW268	**21/07/2020**	20.4	7.33	3.46	90.4	-48.8
MW268	**21/09/2020**	19.8	7.37	2.78	8,611	72.3
MW268	**14/12/2020**	21.7	7.31	1.22	8,601	105
MW268	**16/03/2021**	22.4	7.35	0.76	9,295	58
MW268	**9/06/2021**	18.2	7.21	1.1	10,486	
MW268	**31/08/2021**	22.3	7.28	1.87	6,717	74.9
MW268	**11/11/2021**	22.6	7.33	1.09	5,528	-87.2
MW268	**16/11/2021**	22.3	7.28	1.87	6,717	74.9
MW268	**11/01/2022**	23.6	7.27	1.49	4,495	65.3
MW268	**17/03/2022**	22.9	7.26	1.29	5,494	64.2
MW268	**9/06/2022**	20.9	7.3	1.06	4,018	-9.2
MW268	**6/09/2022**	18.2	7.25	1.97	5,842	-44.1
MW269	**1/08/2017**	19.3	7.32	0.48	1,361	-161
MW269	**12/11/2019**	21.2	7.51	0.46	962	
MW269	**19/12/2019**	19.1	7.55	1.56	827	
MW269	**30/03/2020**	21.9	7.59	1.23	1,408	
MW269	**21/07/2020**	20.3	7.7	7.16	1,837	-136.1
MW269	**21/09/2020**	19.8	7.6	2.16	1,624	-137.3
MW269	**14/12/2020**	21.5	7.67	2.91	1,927	-31.2
MW269	**16/03/2021**	22.7	7.69	0.84	2,366	-230.5
MW269	**9/06/2021**	17.9	7.52	2.07	2,223	
MW269	**31/08/2021**	21.4	7.41	1.61	1,775	-57.2
MW269	**16/11/2021**	21.4	7.41	1.61	1,775	-57.2
MW269	**11/01/2022**	24.2	7.35	1.39	1,738	54.1
MW269	**17/03/2022**	22.1	7.46	1.64	1,700	-224.2
MW269	**9/06/2022**	19	7.32	1.52	1,715	-109.9
MW269	**6/09/2022**	18.5	7.52	1.5	1,578	-10.8
MW282	**18/12/2019**	23.4	6.96	5.08	222.1	
MW282	**31/03/2020**	21.5	6.77	3.55	1,374	
MW282	**22/07/2020**	21.7	7.22	5.12	1,111	18.8
MW282	**24/09/2020**	17.7	7.73	8.14	861	101
MW282	**15/12/2020**	22.7	6.96	1.82	1,198	3.2
MW282	**18/03/2021**	23	7.11	0.97	1,520	12.9
MW282	**9/06/2021**	19.2	7.42	2.37	1,339	
MW282	**31/08/2021**	20	7.21	1.95	1,003	-128.9
MW282	**16/11/2021**	20	7.21	1.95	1,003	-128.9
MW282	**13/01/2022**	21.3	7.03	2.42	1,056	84.1
MW282	**17/03/2022**	22.5	7.09	1.23	1,179	-60.5
MW282	**8/06/2022**	17.7	7.15			97.6
MW282	**8/09/2022**	16.8	7.17	3.05	774	2.1
MW288	**15/07/2020**	19.6	7.48	2.24	1,209	-19.9
MW288	**17/03/2021**	24.4	7.65	2.7	1,415	-177.5
MW288	**31/08/2021**	20.1	7.83	1.09	1,178	57.4
MW288	**12/01/2022**	26.2	7.56	1.28	885	38.8
MW288	**8/06/2022**	19.3	8.06	1.21		8.6
MW288	**6/09/2022**	18.6	6.27	2.55	850	-134
MW289	**30/03/2020**	22.1	7.58	1.6	1,212	
MW289	**22/07/2020**	19.4	7.6	2.21	996	-5.7
MW289	**21/09/2020**	17.6	7.38	2.9	815	33.9
MW289	**15/12/2020**	22.8	7.5	0.59	1,763	-9.2
MW289	**16/03/2021**	24.1	7.82	1.3	1,322	27.3
MW289	**9/06/2021**	19.7	7.54	0.94	2,432	
MW289	**30/08/2021**	19.2	7.68	2.18	1,064	205.7
MW289	**17/03/2022**	23.3	7.34	1.09	1,296	-84.7
MW289	**8/06/2022**	21.2	7.52	0.55	1,206	-36.3
MW289	**5/09/2022**	21.4	7.92	1.77	1,837	-239
MW500	**5/11/2019**	22.1	7.26	3.4	702	
MW500	**15/11/2021**	22.4	7.2	1.5	842	-23
MW500	**10/01/2022**	23.1	7.44	1.3	332.6	-27.3
MW500	**14/03/2022**	24	7.04	0.85	921	72.7
MW500	**7/06/2022**	18.5	7.36	1.34	880	123.1
MW500	**5/09/2022**	20	7.42	1.12	699	65.3
MW516	**30/03/2020**	22.1	7.61	1.45	1,284	
MW516	**21/07/2020**	21.6	7.27	8.47	3,296	8.89

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
MW516	**21/09/2020**	19.1	7.17	1.43	1,359	83.1
MW516	**7/10/2020**	22.6	7.01	0.28	1,418	-65.5
MW516	**16/12/2020**	22.8	7.15	1.14	1,455	5
MW516	**17/02/2021**	22.9	7.03	0.02	1,466	-154.4
MW516	**18/03/2021**	22.5	7.14	0.77	1,504	-136.2
MW516	**9/06/2021**	17.7	7.23	1.66	1,525	
MW516	**31/08/2021**	23.6	7.12	0.87	2,246	72.8
MW516	**16/11/2021**	23.6	7.12	0.87	2,246	72.8
MW516	**12/01/2022**	23.8	7.26	1.27	1,879	-9.4
MW516	**17/03/2022**	22.2	7.32	0.88	1,664	-55.1
MW516	**8/06/2022**	20.2	7.28	0.73	1,229	-66.5
MW516	**6/09/2022**	18.5	7.3	0.68	2,044	50.6

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	Date					
SW130	30/03/2020	23.4	7.94	3.6	54,247	25.6
SW130	15/07/2020	14.8	7.99	7.16	43,600	132.5
SW130	22/09/2020	19.5	8.05	5.02	55,328	36.2
SW130	14/12/2020	21.9	8.05	3.62	52,321	-66.6
SW130	15/03/2021	214	7.93	3.97	51,889	20.1
SW130	8/06/2021	15.6	8.27	4.9	54,570	
SW130	30/08/2021	16.4	7.97	5.59	53,101	-123.8
SW130	10/01/2022	19.8	8.22	4.43	48,660	
SW130	14/03/2022	22.9	8	4.47	54,308	4.7
SW130	7/06/2022	16.5	8	5.66	54,372	-1.4
SW130	5/09/2022	15.4	6.45	4.4	43,551	28.3
SW132	30/03/2020	24.2	8.03	4.17	55,199	55.6
SW132	15/07/2020	14.5	7.99	7.54	43,302	107.8
SW132	22/09/2020	20.8	8.15	4.42	55,837	-3.1
SW132	14/12/2020	21.2	8.02	4.71	56,632	15.5
SW132	15/03/2021	22.3	7.81	3.93	52,769	7.2
SW132	8/06/2021	15.6	8.29	5.37	54,346	
SW132	30/08/2021	16.2	7.99	5.38	53,095	-132.1
SW132	10/01/2022	21.4	8.26	5.13	50,570	
SW132	14/03/2022	24.7	8.05	4.18	56,543	85.8
SW132	7/06/2022	15.9	7.91	5.21	54,347	-9.7
SW132	5/09/2022	18.4	7.78	2.74	47,972	-149.5
SW134	31/03/2020	22	7.92	3.52	52,423	57.8
SW134	15/07/2020	14.6	7.73	11.79	43,369	113.9
SW134	22/09/2020	21.6	8.26	5.34	55,680	31.6
SW134	14/12/2020	21.9	7.98	4.15	56,544	-40.1
SW134	15/03/2021	24	8.08	3.45	56,478	33.1
SW134	8/06/2021	16.5	8.18	4.02	53,625	
SW134	30/08/2021	16.7	7.88	4.34	52,888	-147.8
SW134	10/01/2022	20.7	8.07	3.36	55,557	
SW134	14/03/2022	26.9	7.95	2.57	59,412	-183.9
SW134	7/06/2022	14.4	7.98	5.38	54,465	-9.5
SW134	5/09/2022	19.3	7.94	4.58	49,207	-124.4
SW150	8/01/2020	25.8	8.18	5.9	57,907	42.2
SW150	30/03/2020	23.7	7.8	5.94	52,364	-384
SW150	20/07/2020	17		6.88	18,540	21.3
SW150	23/09/2020	15.5	8.23	9.43	45,427	91.3
SW150	14/12/2020	22.1	8.03	4.72		48
SW150	15/03/2021	25.2	8.26	10.48	56,705	34
SW150	8/06/2021	16.8	8.22	5.32	54,609	
SW150	30/08/2021	17	7.93	5.08	51,820	13.2
SW150	10/01/2022	24.8	8.14	4.04	54,736	
SW150	15/03/2022	26.2	8.13	3.37	56,744	55.9
SW150	8/06/2022	15.1	7.8	5.66	54,333	22.5
SW150	5/09/2022	16.2	8.1	5.54	53,628	3.1
SW152	8/01/2020	25.6	8.2	4.84	58,077	27.5
SW152	30/03/2020	24.2	7.82	5.52	52,771	-369.3
SW152	20/07/2020	18.2		6.27	18,667	15.8
SW152	23/09/2020	15.2	8.19	11.58	45,153	93.9
SW152	14/12/2020	23.4	8.02	4.95	55,960	135.4
SW152	15/03/2021	25.2	8.09	4.32	55,957	87.1
SW152	8/06/2021	17.7	8.23	4.45	54,754	
SW152	30/08/2021	16.8	7.93	5.13	51,556	24.8
SW152	10/01/2022	24.5	8.25	4.11	55,303	
SW152	15/03/2022	26.6	8.15	4.45	56,737	54.4
SW152	8/06/2022	15.1	7.93	5.63	54,382	29.7
SW152	5/09/2022	16.4	8.13	6.31	54,267	32
SW154	8/01/2020	24.6	8.2	4.13	56,911	25.6
SW154	30/03/2020	23.3	7.78	6.78	51,950	-369
SW154	20/07/2020	16.8		6.27	18,529	20.9
SW154	22/09/2020	20.9	8.26	5.34	55,703	41.1
SW154	14/12/2020	23.4	8.05	5.54	55,380	34.5
SW154	15/03/2021	21.4	7.88	4.11	56,985	36.5
SW154	8/06/2021	17	8.24	3.4	54,785	
SW154	30/08/2021	17.1	7.95	6.47	51,910	30.9
SW154	10/01/2022	24.8	8.26	4.14	55,198	
SW154	15/03/2022	26.2	8.08	5.38	55,888	20.3
SW154	8/06/2022	15.6	7.9	6.15	54,362	-17.6
SW154	5/09/2022	16.4	8.09	5.47	54,169	42.7
SW156	8/01/2020	24.8	8.11	5.6	56,063	19.3
SW156	30/03/2020	23.5	7.68	5.1	52,157	-397.7
SW156	20/07/2020	16.9		6.26	18,577	17.6
SW156	23/09/2020	14.6	8.16	10.99	44,567	116.4
SW156	14/12/2020	23.6	8.04	3.43	55,331	49.5
SW156	15/03/2021	22.4	7.95	57.2	57,225	43.6
SW156	8/06/2021	16	7.83	1.1	54,693	
SW156	30/08/2021	17.1	8.01	6.13	52,057	24.2
SW156	10/01/2022	25.1	8.26	3.8	55,276	
SW156	15/03/2022	25.8	7.94	5.47	55,646	55.3
SW156	8/06/2022	15.8	7.9	6.12	54,287	13.9
SW156	5/09/2022	16.4	8.12	5.54	54,193	50.3
SW305	8/01/2020	36.2	8.16	6.01	53,542	21.2
SW305	31/03/2020	24.2	8.04	5.01	55,805	26
SW305	20/07/2020	16.9		7.35	18,674	15.7
SW305	22/09/2020	20.6	8.19	6.41	54,670	-131.4
SW305	15/12/2020	26.2	8.17	5.78	54,290	-120
SW305	15/03/2021	24.2	8.3	4.17	57,377	30.9
SW305	8/06/2021	19	8.17	4.34	54,564	
SW305	1/09/2021	17	7.94	5.17	52,253	-144.2
SW305	11/01/2022	25.3	8.15	4.28	58,620	
SW305	18/03/2022	25.8	8.05	3.5	56,632	-219.1
SW305	8/06/2022	16.1	7.9	3.4		115.3
SW305	5/09/2022	20.9	7.81	4.58	47,079	-117.5

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	Date					
SW309	31/03/2020	22.8	7.91	7.01	52,327	-409.6
SW309	22/07/2020	18		8.2	18,803	11.8
SW309	23/09/2020	19.7	8.43	7.21	56,248	82.4
SW309	15/12/2020	23.9	7.44	0.04	56,055	-284.6
SW309	15/03/2021	24.1	8.31	3.44	57,313	34.9
SW309	8/06/2021	18.7	8.16	4.57	54,325	
SW309	31/08/2021	18.5	7.93	5.15	52,731	-131.1
SW309	13/01/2022	23.6	8.31	4.09	55,170	
SW309	16/03/2022	23.9	7.98	3.86	54,237	12.6
SW309	7/06/2022	15.9	7.96	1.63		97.6
SW309	6/09/2022	18.5	8.06	6.14	43,478	18.9
SW310	31/03/2020	23.4	7.83	8.11	53,515	-411.5
SW310	22/07/2020	18.1		6.24	18,770	9.9
SW310	23/09/2020	19.8	8.38	5.74	56,288	92.4
SW310	15/12/2020	23.4	7.91	3.42	55,586	-213.3
SW310	15/03/2021	23.7	8.31	5.08	57,326	35.3
SW310	8/06/2021	18.5	8.19	4.59	54,526	
SW310	31/08/2021	18.6	8.09	5.78	53,300	-149.8
SW310	13/01/2022	23.7	8.25	3.62	55,167	
SW310	16/03/2022	23.3	8.02	4.14	54,303	57.9
SW310	7/06/2022	13.1	8.04	2.02		140
SW310	6/09/2022	17.6	8.03	5.81	42,081	46.9
SW311	1/04/2020	22.9	7.77	0.01	52,743	-328.8
SW311	22/07/2020	17.5		6.09	18,624	8.6
SW311	23/09/2020	19.8	8.39	6.38	55,922	93.4
SW311	15/12/2020	23.2	8.07	4.98	55,470	65
SW311	16/03/2021	25.2	7.79	3.67	54,256	46.3
SW311	8/06/2021	18.3	8.18	4.54	54,459	
SW311	31/08/2021	22.6	8.07	7.76	52,532	73.4
SW311	13/01/2022	23.4	8.28	4.69	54,300	
SW311	16/03/2022	23.5	8.07	4.56	54,400	50.1
SW311	7/06/2022	13.7	7.87	1.94		77.7
SW311	6/09/2022	18.3	8.02	6.55	43,321	17.4
SW317	8/01/2020	21.2	8.11	13.02	50,724	-56.6
SW317	30/03/2020	22.5	8.16	7.26	51,782	29.1
SW317	21/07/2020	16.1	8.24	6.48	44,741	5.6
SW317	21/09/2020	17.2	6.17	5.8	55,117	23.4
SW317	14/12/2020	24.5	8.11	4.02	55,238	-11.7
SW317	16/03/2021	22.4	8.02	2.9	57,392	95
SW317	9/06/2021	15.6	8.09	6.23	54,368	
SW317	31/08/2021	18.2	8.2	5.21	50,586	70.1
SW317	13/01/2022	25.3	8.11	3.29	54,634	
SW317	16/03/2022	24.8	8.24	4.82	56,016	43.7
SW317	9/06/2022	15.9	8.01	5.89	53,342	20.9
SW317	6/09/2022	18.1	7.85	4.64	45,687	11.8
SW318	8/01/2020	25.7	7.99	24.58	50.43	-21.9
SW318	30/03/2020	22.5	8.28	6.94	54,328	2.5
SW318	21/07/2020	16	8.24	5.48	44,825	1.6
SW318	21/09/2020	17.2	8.11	5.49	55,457	39.2
SW318	14/12/2020	22.7	8.14	4.86	54,887	23.8
SW318	16/03/2021	23	8.06	3.35	57,373	72.5
SW318	9/06/2021	16.5	8.16	5.52	54,493	
SW318	31/08/2021	17.6	8.17	5.13	51,173	65.9
SW318	13/01/2022	25.2	8.19	1.54	55,490	
SW318	16/03/2022	24.9	8.27	5.25	56,666	31.6
SW318	9/06/2022	16.3	8.13	6.01	54,234	20.2
SW318	6/09/2022	16.7	7.94	4.54	45,310	25
SW319	30/03/2020	22.4	8.3	7.07	54,127	-4.2
SW319	21/07/2020	16	8.27	7.28	44,403	7.6
SW319	21/09/2020	17	8.13	5.18	56,641	47.9
SW319	14/12/2020	20.8	8.15	3.93	55,164	53.4
SW319	16/03/2021	24.2	7.73	3.11	54,842	3.1
SW319	9/06/2021	16	7.92	6.08	52,978	
SW319	31/08/2021	17.9	8.12	4.95	51,342	67.8
SW319	13/01/2022	24.6	8.22	1.62	55,633	
SW319	16/03/2022	25	8.21	3.31	56,905	-48.5
SW319	9/06/2022	15.8	8.1	6.39	54,233	15.4
SW319	6/09/2022	16.8	7.91	4.01	45,580	-81.7
SW353	21/07/2020	17.6		7.36	18,659	25.1
SW353	23/09/2020	21.1	8.22	5.05	56,252	87.9
SW353	16/12/2020	22.2	7.48	4.58	55,317	74.4
SW353	16/03/2021	24.9	8.02	4.19	57,163	5.1
SW353	9/06/2021	16	8.04	5.3	53,140	
SW353	30/08/2021	17.5	8	6.62	52,460	81.6
SW353	11/01/2022	24.1	8.17	4.64	52,996	
SW353	14/03/2022	25.7	7.98	4.45	55,745	72.6
SW353	7/06/2022	18.3	7.83	15.32	48,190	-3
SW353	7/09/2022	16.2	8.18	6.42	53,990	118.2
SW370	31/03/2020	22.3	7.97	2.62	55,703	-7.7
SW370	15/07/2020	15.3	7.99	6.87	44,144	-41
SW370	24/09/2020	19.6	7.96	4.42	54,681	-122.4
SW370	15/12/2020	27.1	7.91	4.17	55,292	-194.4
SW370	17/03/2021	28.6	7.96	5.35	56,199	49.2
SW370	9/06/2021	16	8.09	4.92	53,191	
SW370	1/09/2021	16.4	7.67	6.15	51,948	-148.5
SW370	10/01/2022	25.8	8.14	4.43	55,153	
SW370	14/03/2022	28	7.94	3.2	59,788	-25.8
SW370	7/06/2022	14.1	7.67	16.61	42,762	-55.7
SW370	5/09/2022	17.8	7.98	6.54	42,646	63.2
SW371	8/01/2020	29	8.22	13.47	53,812	36.7
SW371	20/07/2020	16.9		12.45	18,501	18.6
SW371	22/09/2020	20.4	8.17	5	54,165	-136.7
SW371	15/12/2020	27.7	8.34	3.69	53,972	-126.3
SW371	17/03/2021	29	8.09	3.4	56,038	19.2
SW371	9/06/2021	16.5	8.15	5.13	54,469	

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
SW371	**1/09/2021**	16.9	7.76	5.24	51,199	-139.3
SW371	**11/01/2022**	28.2	8.12	3.63	57,733	
SW371	**18/03/2022**	26	8.02	3.47	56,482	-167.2
SW371	**8/06/2022**	15.3	7.8	3.47		122.5
SW371	**5/09/2022**	21.3	7.78	3.59	47,227	-235.4
SW372	**8/01/2020**	25.1	8.2	5.89	55,087	48.1
SW372	**31/03/2020**	24	8.16	4.31	66,960	6.3
SW372	**20/07/2020**	17		6.78	18,735	15.6
SW372	**22/09/2020**	20.7	8.19	5.62	53,960	-124.9
SW372	**15/12/2020**	23.7	8.24	4.87	55,961	12.8
SW372	**17/03/2021**	26.9	8.2	4.86	56,457	0.8
SW372	**9/06/2021**	16.1	8.15	4.36	54,535	
SW372	**1/09/2021**	17.3	7.96	6.09	52,046	-152.4
SW372	**12/01/2022**	33.8	8.09	3.17	54,644	
SW372	**18/03/2022**	25.5	8.15	2.74	56,145	-239.5
SW372	**8/06/2022**	16.8	7.82	2.56		126.3
SW372	**6/09/2022**	14	7.84	5.06	41,216	-23.4
SW373	**8/01/2020**	25.1	8.26	8.28	1,193	57.1
SW373	**31/03/2020**	23.8	8.19	5.56	56,004	-0.04
SW373	**20/07/2020**	17.3		6.69	18,791	14.5
SW373	**22/09/2020**	20.9	8.14	8.58	54,251	-135.2
SW373	**15/12/2020**	24.1	8.05	5.75	54,728	-18.5
SW373	**17/03/2021**	25.2	8.21	4.04	57,314	55.2
SW373	**10/06/2021**	18	8.12	4.62	52,927	
SW373	**30/08/2021**	17.2	7.5	4.93	48,992	166.1
SW373	**12/01/2022**	27.8	8.25	4.7	55,809	
SW373	**18/03/2022**	25.5	8	3.66	55,753	-46.4
SW373	**8/06/2022**	16.6	8.01	3.63		110.8
SW373	**6/09/2022**	15.1	7.19	4.94	42,752	8.2
SW382	**21/07/2020**	17.3		5.86	18,592	12
SW382	**23/09/2020**	19.3	8.32	6.18	56,644	70.4
SW382	**16/12/2020**	21.6	8.14	4.61	55,161	80.1
SW382	**17/03/2021**	25.9	8.04	4.36	55,200	74.4
SW382	**10/06/2021**	19.1	8.09	3.75	53,643	
SW382	**30/08/2021**	18.2	8.13	5.2	52,620	63.8
SW382	**11/01/2022**	24.6	8.25	3.82	54,142	
SW382	**14/03/2022**	26.3	8.06	3.92	56,095	61.9
SW382	**7/06/2022**	17.6	7.95	6.56	47,986	45.5
SW382	**7/09/2022**	15.8	8.19	6.47	54,119	109.1
SW383	**21/07/2020**	17.2		10	18,647	13
SW383	**23/09/2020**	19.2	8.31	6.29	56,099	78.7
SW383	**16/12/2020**	21.9	8.15	4.71	55,319	76.1
SW383	**17/03/2021**	24.7	8.08	4.95	55,855	71.1
SW383	**10/06/2021**	19.2	8.68	3.09	53,039	
SW383	**30/08/2021**	17.6	8.13	5.93	52,224	61.8
SW383	**11/01/2022**	24.5	8.26	3.87	54,062	
SW383	**14/03/2022**	25.7	8.04	4.27	56,257	64
SW383	**7/06/2022**	18	7.94	10.43	48,455	33.6
SW383	**7/09/2022**	15.9	8.2	6.49	53,190	111.3
SW384	**21/07/2020**	17.3		7.67	18,618	8.9
SW384	**16/12/2020**	22.5	8.13	4.23	55,381	70.5
SW384	**17/03/2021**	24.5	8.11	4.39	56,098	71.3
SW384	**10/06/2021**	20.5	8.24	4.29	53,296	
SW384	**30/08/2021**	17.1	8.08	6.21	52,220	82.2
SW384	**11/01/2022**	23.9	8.24	3.82	53,042	
SW384	**14/03/2022**	25.8	8.05	4.05	56,226	65.7
SW384	**7/06/2022**	17.8	7.9	13.4	47,984	16.7
SW384	**7/09/2022**	15.8	8.2	6.07	53,380	113.6
SW406	**14/01/2020**	26.8	8.05	7.13	31,500	-75.2
SW406	**1/04/2020**	27.7	8.02	3.79	58,512	49.4
SW406	**22/07/2020**	15.6		5.27	18,223	20
SW406	**21/09/2020**	20.2	8.09	4.24	56,799	-113.3
SW406	**15/12/2020**	22	7.9	4.84	54,808	-65.4
SW406	**17/03/2021**	24.4	8.14	4.82	55,591	71
SW406	**10/06/2021**	20.4	7.95	3.64	53,197	
SW406	**31/08/2021**	21.6	8.03	4.74	52,058	-119.2
SW406	**14/01/2022**	25.2	8.03	4.05	55,317	
SW406	**16/03/2022**	26.5	8.19	4.4	58,606	41.3
SW406	**7/06/2022**	15.6	7.9	2.09		43.9
SW406	**7/09/2022**	13.6	8.2	7.45	53,221	111.7
SW408	**14/01/2020**	26.5	8.01	6.5	28,477	-63.7
SW408	**1/04/2020**	24	8.01	4.93	54,299	-20.5
SW408	**22/07/2020**	15.8		5.75	18,263	18.4
SW408	**21/09/2020**	20.4	8.1	5.03	56,275	-104.8
SW408	**15/12/2020**	19.8	7.97	4.85	53,676	77
SW408	**17/03/2021**	24.8	8.1	3.17	57,531	55.5
SW408	**10/06/2021**	18.1	8.92	6.24	53,402	
SW408	**31/08/2021**	22.1	7.72	5.87	50,239	6.3
SW408	**14/01/2022**	24.9	8.11	3.43	53,794	
SW408	**16/03/2022**	26.2	8.19	5.17	58,134	-39.7
SW408	**7/06/2022**	14.9	7.43	2.51		-4.5
SW408	**7/09/2022**	14.9	7.7	6.35	22,150	25
SW410	**14/01/2020**	28.7	8.17	6.08	32,170	-98.5
SW410	**2/04/2020**	23.6	7.77	5.63	53,657	-255.1
SW410	**21/07/2020**	12.8	8.14	7.81	22,026	29.9
SW410	**22/09/2020**	19.5	8.21	4.06	56,669	-167.4
SW410	**15/12/2020**	20.4	8	4.3	55,888	38.3
SW410	**17/03/2021**	25.1	8.16	3.66	57,553	61.6
SW410	**10/06/2021**	18	8.62	5.89	53,555	
SW410	**31/08/2021**	21.2	7.91	6.06	51,621	-88.1
SW410	**14/01/2022**	25	8.17	4.2	56,090	
SW410	**16/03/2022**	25.5	8.2	4.75	57,589	-11.3
SW410	**7/06/2022**	16.8	7.8	3.65		3.5
SW410	**6/09/2022**	19.6	7.89	4.4	47,561	-3.8
SW412	**14/01/2020**	26.5	8.19	6.52	58,803	-68.4

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
SW412	**1/04/2020**	23.7	7.66	6.2	53,555	-279.1
SW412	**21/07/2020**	14.6	8.14	6.45	43,445	34
SW412	**22/09/2020**	18.6	8.07	4.1	56,982	-181.7
SW412	**15/12/2020**	24.4	8.09	4.33	55,088	39.9
SW412	**18/03/2021**	24	8.09	4.02	55,929	42.6
SW412	**10/06/2021**	19.2	8.1	4.93	54,169	
SW412	**1/09/2021**	16.5	8.09	7.19	27,903	97.5
SW412	**14/01/2022**	25.2	8.3	3.76	56,660	
SW412	**16/03/2022**	25.2	8.14	4.41	57,345	43.7
SW412	**7/06/2022**	15.5	7.99	3.96		86.5
SW412	**6/09/2022**	17.4	8.16	6.69	41,793	-8.5
SW414	**14/01/2020**	27.2	8.08	7.16	30,498	-65.2
SW414	**2/04/2020**	23.3	8.1	21.22	56,542	131.6
SW414	**21/07/2020**	15.5	8.09	6.03	44,857	42.3
SW414	**22/09/2020**	19.3	8.16	4.7	56,965	-128.2
SW414	**15/12/2020**	24.9	8.1	3.77	56,119	23.8
SW414	**18/03/2021**	26.2	8.06	3.08	57,773	67.8
SW414	**10/06/2021**	20.1	7.72	1.8	54,076	
SW414	**1/09/2021**	16.8	8.04	6.65	52,110	90.4
SW414	**14/01/2022**	25.6	8.32	3.88	57,522	
SW414	**16/03/2022**	25.9	8.17	4.26	57,465	37.8
SW414	**7/06/2022**	15.4	7.96	4.01		75.4
SW414	**6/09/2022**	17.7	8.17	6.79	42,074	2.2
SW416	**14/01/2020**	28.1	8.17	6.18	50,238	-74.3
SW416	**2/04/2020**	23	8.12	5.86	53,672	139.4
SW416	**21/07/2020**	15.7	8.15	5.94	44,851	43.1
SW416	**22/09/2020**	21.6	8.17	4.57	56,988	-116.5
SW416	**15/12/2020**	24.9	8.14	4.14	56,798	19.9
SW416	**18/03/2021**	25	8.11	3.6	57,455	57.8
SW416	**10/06/2021**	17.7	8.56	5.27	53,503	
SW416	**1/09/2021**	17.1	7.97	6.6	52,410	83.5
SW416	**14/01/2022**	25.2	8.34	3.96	57,135	
SW416	**16/03/2022**	25.5	8.17	4.32	57,889	-12.9
SW416	**7/06/2022**	15.8	8.05	4.5		61.7
SW416	**6/09/2022**	18.7	8.15	6.45	42,875	67.5

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
PW304	**8/01/2020**	23.1	7.64	3.42		-95.9
PW304	**1/04/2020**	20.3	8.26	7.01	24,093	-26.7
PW304	**20/07/2020**	18.5		1.22	14,406	-71.1
PW304	**22/09/2020**	17.9	7.29	0.79	39,723	
PW304	**15/12/2020**	27	7.24	0.51	44,353	
PW304	**15/03/2021**	20.8	7.32	1.17	48,004	
PW304	**10/06/2021**	18.5	7.76	4.7	33,159	
PW304	**1/09/2021**	16.6	7.65	2.62	51,304	43.4
PW304	**11/01/2022**	25.8	7.43	0.5	60,090	
PW304	**8/06/2022**	14.9	7.47	1.8		84.8
PW304	**5/09/2022**	20.1	7.67	1.54	8,335	-259.9
PW306	**31/03/2020**	23.7	6.79	1.72	56,187	-418.6
PW306	**22/07/2020**	17.3		7.65	18,326	23.3
PW306	**23/09/2020**	16.1	7.84	19.39	55,838	
PW306	**15/12/2020**	23.7	7.47	0.71	55,732	
PW306	**17/03/2021**	24.5	7.6	1.16	58,544	
PW306	**9/06/2021**	15.9	7.95	4.23	54,619	
PW306	**31/08/2021**	18	7.57	6.13	52,146	29.9
PW306	**13/01/2022**	25.9	7.74	0.97	55,478	
PW306	**16/03/2022**	24.6	7.7	4.01	55,887	32
PW306	**7/06/2022**	14.8	7.3	0.69		-244.1
PW306	**6/09/2022**	17.8	8.13	6.78	42,474	20
PW307	**31/03/2020**	25.1	7.07	1.82	54,463	-418.5
PW307	**22/07/2020**	17.2			18,913	23
PW307	**23/09/2020**	19.6	8.02	3.72	56,666	
PW307	**15/12/2020**	22.8	7.73	2.5	55,544	
PW307	**17/03/2021**	23.8	8	3.87	58,544	
PW307	**9/06/2021**	15.5	8.07	4.86	54,395	
PW307	**31/08/2021**	17.6	8.04	5.36	53,079	-119.8
PW307	**13/01/2022**	25.3	7.91	1.09	56,400	
PW307	**16/03/2022**	24.2	7.82	3.59	55,319	59.9
PW307	**7/06/2022**	15	8	2.11		100.7
PW307	**6/09/2022**	17.5	7.96	6.42	41,877	64.3
PW308	**1/04/2020**	23.2	8.16	5.61	51,183	-12.4
PW308	**22/07/2020**	17.1		7.55	18,584	12.3
PW308	**23/09/2020**	17.5	8.15	7.67	47,667	
PW308	**15/12/2020**	23.4	7.88	3.33	55,712	
PW308	**17/03/2021**	25.2	7.92	3.2	57,750	
PW308	**9/06/2021**	16.5	8.05	4.82	53,704	
PW308	**31/08/2021**	20.6	8.11	7.64	51,369	72.7
PW308	**13/01/2022**	26.2	8.04	1.08	56,087	
PW308	**16/03/2022**	24.2	8.04	4.43	28,413	49
PW308	**7/06/2022**	14.7	7.97	3.08		79.1
PW308	**6/09/2022**	18.2	8.04	6.63	42,881	10.1
PW314	**31/03/2020**	22.7	7.01	1.94	50,749	-404.3
PW314	**22/07/2020**	18.1		6.09	18,920	15.9
PW314	**23/09/2020**	17.8	7.91	1.28	56,902	
PW314	**15/12/2020**	25.7	7.01	1.56		
PW314	**17/03/2021**	24.3	7.66	3.11	60,103	
PW314	**9/06/2021**	15.5	7.96	4.12	54,449	
PW314	**31/08/2021**	18	7.9	4.46	53,616	-127.4
PW314	**13/01/2022**	24.7	7.8	0.92	56,016	
PW314	**16/03/2022**	24.8	7.55	1.68	56,206	41.7
PW314	**7/06/2022**	15.8	7.61	1.25		85.4
PW314	**6/09/2022**	17.8	41.4	5.83	42,404.27	
PW315	**1/04/2020**	24.2	8.23	5.99	51,079	-19.8
PW315	**22/07/2020**	16.6		5.71	18,647	16.5
PW315	**23/09/2020**	16.6	7.91	5.14	46,745	
PW315	**15/12/2020**	23.9	6.71	0.83	56,808	
PW315	**17/03/2021**	25.1	7.89	3.54	57,309	
PW315	**9/06/2021**	15.2	8.05	4.76	54,490	
PW315	**31/08/2021**	18.2	7.94	10.97	1,765	80
PW315	**13/01/2022**	25.5	7.94	1.31	56,137	
PW315	**16/03/2022**	24.5	7.66	3.73	56,140	57.1
PW315	**7/06/2022**	15.5	7.7	1.38		97.7
PW315	**6/09/2022**	17.2	8.13	6.46	38,278	20.7
PW316	**1/04/2020**	22.4	7.43	0.03	58,295	-410.8
PW316	**22/07/2020**	17.6		7.3	18,730	9.6
PW316	**23/09/2020**	16.8	8.02	10.81	47,057	
PW316	**15/12/2020**	23.4	7.84	3.22	56,627	
PW316	**17/03/2021**	26.6	7.96	3.33	60,123	
PW316	**9/06/2021**	15.4	8.08	5.21	54,614	
PW316	**31/08/2021**	17.4	8.01	5.27	53,034	-157.9
PW316	**13/01/2022**	24.5	8	1.33	55,679	
PW316	**16/03/2022**	24.5	7.87	4.21	56,064	-37.3
PW316	**7/06/2022**	15.3	7.96	2.43		88.8
PW316	**6/09/2022**	17.8	8.12	6.65	42,533	20.8
PW329	**9/01/2020**	24.5	7.45	2.08	67,738	196.4
PW329	**30/03/2020**	22	6.79	1.72	56,187	-418.6
PW329	**20/07/2020**	15		9.23	18,249	14.4
PW329	**23/09/2020**	14.7	7.72	2.52	45,149	
PW329	**14/12/2020**	22	7.61	1.09	54,407	
PW329	**16/03/2021**	23.1	7.57	2.36	57,859	
PW329	**8/06/2021**	15.1	7.59	1.22	53,614	
PW329	**30/08/2021**	14.9	7.95	1.98	52,022	-12.6
PW329	**10/01/2022**	24.9	7.45	0.11	63,330	
PW329	**15/03/2022**	26.2	7.73	1.49	57,145	-2.3
PW329	**8/06/2022**	16.4	7.49	3.49	54,744	4.7
PW329	**5/09/2022**	15.9	7.76	1.1	54,958	-146.4
PW330	**9/01/2020**	24.3	7.25	2.17	69,074	-188.5
PW330	**30/03/2020**	22	7.07	1.82	54,463	-418.5
PW330	**20/07/2020**	15.1		6.18	18,514	15.5
PW330	**22/09/2020**	19	7.75	1.88	55,768	

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
PW330	**14/12/2020**	22.6	7.67	1.08	54,711	
PW330	**16/03/2021**	24	7.67	0.81	57,538	
PW330	**8/06/2021**	14.8	7.21	2.87	53,016	
PW330	**30/08/2021**	15.4	7.78	4.67	52,755	41.9
PW330	**10/01/2022**	23.5	7.64	0.8	62,077	
PW330	**15/03/2022**	25.5	7.86	1.83	57,452	13.1
PW330	**8/06/2022**	14.9	7.12	1.54	55,396	-67.8
PW330	**5/09/2022**	15.9	7.73	0.88	56,245	-48.8
PW331	**9/01/2020**	25.7	7.48	4.99	32,835	-136.1
PW331	**30/03/2020**	22.2	7.01	1.94	50,749	-404.3
PW331	**20/07/2020**	15.7		6.52	18,665	14.7
PW331	**23/09/2020**	17.2	7.8	1.556	56,304	
PW331	**14/12/2020**	21.2	7.61	1.33	55,666	
PW331	**16/03/2021**	24.9	7.59	16	58,310	
PW331	**8/06/2021**	15.8	6.68	2.18	54,740	
PW331	**30/08/2021**	16.9	8.03	6.15	51,797	22.8
PW331	**10/01/2022**	23.3	7.61	0.48	60,610	
PW331	**15/03/2022**	25.5	7.59	0.91	58,760	58.4
PW331	**8/06/2022**	14.9	7.43	2.63	55,637	2.3
PW331	**5/09/2022**	16.9	7.8	2.74	53,876	-17.8
PW335	**30/03/2020**	21	7.39	29.1	50,171	-56.8
PW335	**15/07/2020**	13.5	7.19	6.94	40,653	253.1
PW335	**22/09/2020**	17.7	7.65	1.23	55,023	
PW335	**14/12/2020**	21.9	7.48	0.53	52,709	
PW335	**15/03/2021**	20.3	7.48	2.09	53,257	
PW335	**8/06/2021**	14.6	7.58	0.69	53,928	
PW335	**30/08/2021**	15.8	7.8	3.57	52,830	-148.6
PW335	**10/01/2022**	22	7.82	1.48	52,616	
PW335	**14/03/2022**	23	8.06	4.15	54,374	60.5
PW335	**7/06/2022**	14.4	7.58	2.01	54,988	-46.9
PW335	**5/09/2022**	15.9	7.54	0.91	44,876	-119.5
PW340	**30/03/2020**	20.5	7.3	1.76	42,669	-61
PW340	**15/07/2020**	13.9	7.54	5.92	42,386	179.8
PW340	**22/09/2020**	18.8	7.81	1.04	56,070	
PW340	**14/12/2020**	20.8	7.5	0.27	56,509	
PW340	**15/03/2021**	21.1	7.51	1.59	62,031	
PW340	**8/06/2021**	14.5	7.98	1.3	52,583	
PW340	**30/08/2021**	15.9	7.72	1.91	51,746	-145.1
PW340	**10/01/2022**	22.5	7.87	1.47	52,319	
PW340	**14/03/2022**	25.8	7.58	0.67	58,496	-117.9
PW340	**7/06/2022**	14.8	7.52	1.36	55,300	-86.6
PW340	**5/09/2022**	15.2	7.66	1.96	25,584	-156.3
PW341	**8/01/2020**	23.1	7.64	5.02	57,353	135.6
PW341	**31/03/2020**	20.6	7.39	29.1	50,171	-56.8
PW341	**15/07/2020**	14.2	7.24	5.35	41,354	-50
PW341	**22/09/2020**	19.2	7.91	1.82	56,627	
PW341	**14/12/2020**	21.7	6.99	0.85	56,361	
PW341	**15/03/2021**	21.7	7.55	1.35	53,674	
PW341	**8/06/2021**	13.9	7.92	1.46	54,796	
PW341	**30/08/2021**	16	7.76	2.42	50,897	-175.3
PW341	**10/01/2022**	22.3	7.81	0.55	56,536	
PW341	**14/03/2022**	26.4	7.68	1.16	59,392	-169.4
PW341	**7/06/2022**	14.7	7.59	1.47	54,044	
PW341	**5/09/2022**	18.6	7.79	0.93	48,981	-205.7
PW345	**31/03/2020**	21	7.3	1.76	42,669	-61
PW345	**24/09/2020**	18.5	7.35	0.75	57,105	
PW345	**15/12/2020**	24.5	6.93	0.56	60,970	
PW345	**16/03/2021**	25.7	7.08	1.31	53,528	
PW345	**9/06/2021**	15.6	7.98	6.59	51,954	
PW345	**1/09/2021**	15.7	6.99	1.34	41,671	-214.3
PW345	**10/01/2022**	24.7	7.08	0.31	58,841	
PW345	**14/03/2022**	25.7	7.48	0.92	59,113	-42
PW345	**7/06/2022**	14.2	7.72	12.53	44,314	89.6
PW345	**5/09/2022**	17.8	7.89	5.16	41,294	86.6
PW346	**8/01/2020**	24.6	7.36	48.3	20,522	-262
PW346	**1/04/2020**	23.9	7.74	4.82	55,889	-410.8
PW346	**15/07/2020**	16	8.14	4.27	20,001	76.8
PW346	**22/09/2020**	20.8	7.5	1.84	30,121	
PW346	**15/12/2020**	23.3	7.61	0.3	18,731	
PW346	**17/03/2021**	30.5	6.96	0.37	46,731	
PW346	**10/06/2021**	19.3	8.13	0.83	51,243	
PW346	**30/08/2021**	17.1	7.65	2.81	50,379	-194.7
PW346	**12/01/2022**	25.1	7.46	0.63	50,919	
PW346	**8/06/2022**	15.4	7.5	0.05		14.1
PW346	**6/09/2022**	14.2	7.31	2.98	42,328	9.9
PW350	**21/07/2020**	16.5		6.8	18,303	23.1
PW350	**23/09/2020**	17.5	8.12	6.23	56,574	
PW350	**16/12/2020**	22.5	7.62	1.52	57,539	
PW350	**17/03/2021**	23.8	7.53	3.87	58,595	
PW350	**8/06/2021**	19.1	8.06	4.05	55,302	
PW350	**30/08/2021**	17.2	8.05	6	52,311	86.1
PW350	**11/01/2022**	25.2	7.89	3.21	55,250	
PW350	**14/03/2022**	26	7.92	4.62	56,464	67
PW350	**7/06/2022**	17.8	7.88	13.69	48,194	8.6
PW350	**7/09/2022**	15.2	8.11	6.71	47,882	116.2
PW351	**2/04/2020**	22.7	8.08	9.25	56,049	152.7
PW351	**21/07/2020**	17		83.53	18,736	19
PW351	**24/09/2020**	17.6	8.28	6.66	56,307	
PW351	**16/12/2020**	23.5	7.91	4.1	55,060	
PW351	**17/03/2021**	23.4	7.7	3.19	56,494	
PW351	**8/06/2021**	17.8	8.1	5.19	54,474	
PW351	**30/08/2021**	17.1	8.12	5.94	52,547	66.8
PW351	**11/01/2022**	23.7	8.04	2.74	55,615	
PW351	**14/03/2022**	26.9	7.84	3.26	56,513	61.9
PW351	**7/06/2022**	17.4	7.92	8.56	47,550	42.2

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
PW351	**7/09/2022**	15.8	8.15	7.5	28,328	110.2
PW352	**2/04/2020**	22.6	8.08	4.93	52,997	148.2
PW352	**21/07/2020**	17.3		7.11	18,624	10.7
PW352	**24/09/2020**	18.1	8.16	5.48	56,425	
PW352	**16/12/2020**	21.3	7.39	5	54,903	
PW352	**17/03/2021**	24	7.91	4.34	56,595	
PW352	**8/06/2021**	16.9	8.09	5.76	54,512	
PW352	**30/08/2021**	18.4	8.12	5.42	52,492	98.3
PW352	**11/01/2022**	23.2	8.08	2.4	56,068	
PW352	**14/03/2022**	25.9	7.95	4.06	31,412	61.8
PW352	**7/06/2022**	17.4	7.83	5.09	47,701	-77.8
PW352	**7/09/2022**	17.6	8.16	7.85	46,413	108.7
PW356	**9/01/2020**	23.5	6.86	6.05	60,462	-259.1
PW356	**30/03/2020**	21.3	6.82	1.42	61,435	-389.9
PW356	**20/07/2020**	15.8		5.3	18,666	15
PW356	**23/09/2020**	17.5	7.55	1	55,640	
PW356	**14/12/2020**	20.5	7.37	1.08	54,535	
PW356	**16/03/2021**	24.4	7.43	2.52	58,190	
PW356	**8/06/2021**	15.3	7.79	1.43	55,052	
PW356	**30/08/2021**	15.9	7.8	2.82	52,187	-68.1
PW356	**10/01/2022**	23.5	7.57	0.82	61,565	
PW356	**15/03/2022**	24.9	7.42	1.44	58,725	70.8
PW356	**8/06/2022**	14.7	7.48	3.63	54,998	-18.2
PW356	**5/09/2022**	15.8	8.08	5.42	54,010	58.8
PW357	**9/01/2020**	23.8	7.53	6.51	64,613	121.8
PW357	**30/03/2020**	22.4	7.13	3.24	54,056	-416.7
PW357	**20/07/2020**	14.6		6.87	18,404	16.2
PW357	**23/09/2020**	17.7	7.87	2.73	56,372	
PW357	**14/12/2020**	21.2	7.67	1.44	54,899	
PW357	**16/03/2021**	24.6	7.64	0.67	58,069	
PW357	**8/06/2021**	15.6	7.71	1.85	54,595	
PW357	**30/08/2021**	15.5	7.88	2.09	52,365	40.3
PW357	**10/01/2022**	23.5	7.62	0.71	60,931	
PW357	**15/03/2022**	26.3	7.68	1.05	58,198	52.3
PW357	**8/06/2022**	14.5	7.32	0.75	55,126	-280.9
PW357	**5/09/2022**	16.6	7.74	0.7	55,272	-111.8
PW358	**9/01/2020**	24.4	7.63	4.28	58,439	-94
PW358	**30/03/2020**	22.1	6.93	1.97	58,689	-418.7
PW358	**20/07/2020**	14.6		7.01	18,115	14.9
PW358	**23/09/2020**	15.5	7.82	3.88	45,541	
PW358	**14/12/2020**	23.6	7.63	1.45	54,471	
PW358	**16/03/2021**	23.2	7.71	1.33	57,869	
PW358	**8/06/2021**	14.6	7.86	2.68	56,302	
PW358	**30/08/2021**	16.1	7.86	2.28	52,348	3.7
PW358	**10/01/2022**	24.1	7.68	0.55	62,130	
PW358	**15/03/2022**	26.9	7.55	0.65	56,858	-172.6
PW358	**8/06/2022**	16.5	7.6	4.43	54,480	-8.1
PW358	**5/09/2022**	15.9	7.38	1.12	55,426	-193.4
PW362	**31/03/2020**	23.5	6.82	1.42	61,435	-389.9
PW362	**15/07/2020**	14.5	7.61	4.22	43,408	178.3
PW362	**22/09/2020**	18.7	7.87	1.88	56,809	
PW362	**14/12/2020**	22.6	7.43	0.61	57,404	
PW362	**15/03/2021**	23.9	7.51	0.72	57,350	
PW362	**8/06/2021**	14.6	8.04	0.96	53,285	
PW362	**30/08/2021**	15.8	7.81	1.92	52,304	-148
PW362	**10/01/2022**	22.7	7.67	1.05	58,489	
PW362	**14/03/2022**	27.4	7.64	1.4	60,526	-40.7
PW362	**7/06/2022**	14.4	7.52	1.34	54,642	-108.3
PW362	**5/09/2022**	18.9	7.64	1.42	48,174	-90.3
PW363	**8/01/2020**	23.8	7.11	3.05	69,188	-129
PW363	**31/03/2020**	21.5	7.13	3.24	54,056	-416.7
PW363	**15/07/2020**	13.9	7.48	2.81	41,182	-92.7
PW363	**22/09/2020**	19.9	7.91	1.38	55,586	
PW363	**14/12/2020**	21.3	7.55	4.51	24,009	
PW363	**15/03/2021**	21.4	7.5	1.37	52,385	
PW363	**8/06/2021**	14.3	7.8	1.26	54,079	
PW363	**30/08/2021**	15.7	7.76	1.71	50,818	-159.3
PW363	**10/01/2022**	21.5	7.77	0.77	56,876	
PW363	**14/03/2022**	25.9	7.56	0.68	58,150	-121.3
PW363	**7/06/2022**	14.5	7.9	5.41	54,361	-42
PW363	**5/09/2022**	17.7	7.8	1.15	47,879	-259.7
PW364	**30/03/2020**	21.5	7.36	2.65	43,880	67.5
PW364	**15/07/2020**	13.5	6.84	10.07	41,952	284.3
PW364	**22/09/2020**	18	7.73	1.69	56,579	
PW364	**14/12/2020**	21.9	7.71	1.33	52,723	
PW364	**15/03/2021**	21.6	7.49	38.3	58,261	
PW364	**8/06/2021**	14.1	7.77	1.15	54,349	
PW364	**30/08/2021**	15.7	7.71	1.99	51,760	-152.6
PW364	**10/01/2022**	22.4	7.8	1.2	52,437	
PW364	**14/03/2022**	25.7	7.67	0.74	58,055	-117.8
PW364	**7/06/2022**	14.6	7.83	2.54	54,787	2.1
PW364	**5/09/2022**	16.1	7.49	0.8	44,920	-32
PW367	**8/01/2020**	23.4	6.84	3.24	41,500	-340.3
PW367	**31/03/2020**	20.3	6.93	1.97	58,689	-418.7
PW367	**15/07/2020**	14.6	7.62	7.22	43,502	-26
PW367	**22/09/2020**	19	7.66	1.17	57,337	
PW367	**15/12/2020**	26.1	7.16	0.56	55,209	
PW367	**15/03/2021**	22.2	7.24	0.26	59,018	
PW367	**9/06/2021**	15.3	8.05	4.66	54,591	
PW367	**1/09/2021**	16.7	7.46	2.17	49,987	9.9
PW367	**11/01/2022**	26.8	7.02	0.19	60,793	
PW367	**14/03/2022**	25.2	7.23	0.92	58,624	-45.2
PW367	**7/06/2022**	14.5	7.53	15.21	41,275	-41.2
PW367	**5/09/2022**	19.7	7.9	5.16	45,001	72.7
PW368	**8/01/2020**	22.7	7.65	1.9	41,833	-110.7

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
PW368	**1/04/2020**	19.5	7.07	8.09	52,861	-385.6
PW368	**20/07/2020**	16.3		4.51	17,792	0.8
PW368	**22/09/2020**	18.5	7.64	0.72	39,335	
PW368	**15/12/2020**	23.6	7.44	2.04	47,485	
PW368	**15/03/2021**	23.9	7.65	0.69	57,703	
PW368	**10/06/2021**	19.4	8	5.95	39,536	
PW368	**1/09/2021**	16.6	7.46	5.05	51,073	91.8
PW368	**11/01/2022**	24.6	7.75	1.02	28,474	
PW368	**8/06/2022**	15.4	7.48	0.01		153
PW368	**5/09/2022**	20.7	7.51	0.38	44,515	-327.3
PW369	**31/03/2020**	22.1	7.36	2.65	43,880	67.5
PW369	**15/07/2020**	14.8	7.5	7.73	43,326	4.1
PW369	**24/09/2020**	19.1	7.47	8.17	56,648	
PW369	**15/12/2020**	24.2	7.44	0.65	56,933	
PW369	**16/03/2021**	23.6	7.38	0.77	57,841	
PW369	**9/06/2021**	16.1	8.08	5.59	53,760	
PW369	**1/09/2021**	16.5	6.82	6.38	24,706	-100.5
PW369	**10/01/2022**	24.3	7.49	1.13	57,939	
PW369	**14/03/2022**	25.9	7.46	0.72	58,077	-152.3
PW369	**7/06/2022**	12.9	7.59	15.64	40,112	63.8
PW369	**5/09/2022**	17.4	7.77	6.07	41,771	92.6
PW374	**8/01/2020**	23.2	7.7	25.94	35,007	-87.8
PW374	**30/03/2020**	22.2	8.26	7.01	24,093	-26.7
PW374	**21/07/2020**	15.7	8.2	6.61	44,268	7.1
PW374	**21/09/2020**	16.7	7.87	3.73	57,017	
PW374	**14/12/2020**	22.3	7.86	3.67	57,881	
PW374	**15/03/2021**	25.3	7.97	3.51	58,314	
PW374	**10/06/2021**	17.4	8.53	3.83	53,469	
PW374	**1/09/2021**	15.9	8	5.73	52,210	-142.9
PW374	**13/01/2022**	24.8	7.96	1.29	55,449	
PW374	**16/03/2022**	25	7.9	3.31	57,201	1.5
PW374	**9/06/2022**	17.4	7.99	4.55	53,260	14.2
PW374	**6/09/2022**	16.9	7.86	3.58	46,041	-9.8
PW375	**8/01/2020**	22	79.1	12.59	42,272	-36.4
PW375	**30/03/2020**	21.7	8.16	5.61	51,183	-12.4
PW375	**21/07/2020**	14.7	8.02	6.09	43,714	9.9
PW375	**21/09/2020**	16.5	8.01	3.55	56,952	
PW375	**14/12/2020**	24	7.78	2.31	55,851	
PW375	**15/03/2021**	23.9	8	3.34	57,606	
PW375	**10/06/2021**	17.5	8.68	3.89	53,567	
PW375	**1/09/2021**	15.8	7.94	5.27	52,402	-142.9
PW375	**13/01/2022**	24.6	7.95	1.58	52,821	
PW375	**16/03/2022**	23.4	7.94	4.99	44,720	37.3
PW375	**9/06/2022**	17.3	8.04	3.69	53,245	12.9
PW375	**6/09/2022**	17.1	7.7	3.52	43,774	26.8
PW378	**8/01/2020**	22.3	7.9	4.87	47,074	-63.6
PW378	**30/03/2020**	22	8.23	5.99	51,079	-19.8
PW378	**21/07/2020**	16.1	7.95	4.95	43,398	4.8
PW378	**21/09/2020**	15.4	7.97	4.6	56,705	
PW378	**14/12/2020**	24.8	7.76	1.41	54,510	
PW378	**15/03/2021**	23.5	7.93	2.54	57,464	
PW378	**10/06/2021**	18.2	8.44	3.57	53,363	
PW378	**1/09/2021**	16	7.95	5.75	52,460	-153.8
PW378	**13/01/2022**	26.2	7.83	1.95	55,543	
PW378	**16/03/2022**	24.1	7.94	5.05	49,057	45.4
PW378	**9/06/2022**	16.9	7.96	5.43	53,317	20.3
PW378	**6/09/2022**	17.3	7.72	3.4	46,871	13.4
PW380	**2/04/2020**	22.7	8.1	9.25	56,049	152.7
PW380	**2/04/2020**	22.7	8.1	9.25	56,049	152.7
PW380	**21/07/2020**	16.4		5.27	18,484	7.3
PW380	**24/09/2020**	17.1	8.28	6.66	56,307	
PW380	**16/12/2020**	23.4	7.93	4.6	55,051	
PW380	**17/03/2021**	24.2	7.76	4.34	59,060	
PW380	**8/06/2021**	18.5	8	4.75	54,758	
PW380	**30/08/2021**	17.3	8.11	5.43	52,878	67.3
PW380	**11/01/2022**	24.8	8.01	2.77	56,023	
PW380	**14/03/2022**	25.6	7.93	3.16	56,359	64.5
PW380	**7/06/2022**	15.9	7.89	12.07	46,611	37.6
PW380	**7/09/2022**	15.7	8.15	8.48	46,559	111.2
PW381	**2/04/2020**	22.5	8.08	3.81	53,296	143.1
PW381	**2/04/2020**	23.1	7.93	6.61	3,425	143.1
PW381	**2/04/2020**	23.1	7.93	6.61	3,425	140.3
PW381	**2/04/2020**	23.1	7.93	6.61	3,425	140.3
PW381	**21/07/2020**	17.7		4.43	18,712	11.3
PW381	**24/09/2020**	17.5	8.29	6.43	56,340	
PW381	**16/12/2020**	22.6	7.92	3.35	56,056	
PW381	**17/03/2021**	24	7.85	3.59	56,218	
PW381	**8/06/2021**	17.8	8.19	4.69	54,811	
PW381	**30/08/2021**	17.4	8.14	5.78	52,556	63
PW381	**11/01/2022**	23.1	8.09	3.33	56,267	
PW381	**14/03/2022**	25.8	7.96	3.62	56,688	60.7
PW381	**7/06/2022**	17.6	7.95	6.31	48,013	52.4
PW381	**7/09/2022**	15.4	8.16	7.99	53,813	109.1
PW401	**2/04/2020**	22.3	8.3	5.02	55,612	162
PW401	**2/04/2020**	22.3	8.3	5.02	55,612	162
PW401	**2/04/2020**	22.3	8.3	5.02	55,612	162
PW401	**2/04/2020**	22.3	8.3	5.02	55,612	162
PW401	**2/04/2020**	22.3	8.3	5.02	55,612	162
PW401	**21/07/2020**	17.2		6.01	18,593	14.6
PW401	**23/09/2020**	17	8.21	6.52	56,484	
PW401	**16/12/2020**	22.5	7.45	3.3	56,682	
PW401	**17/03/2021**	24	7.76	4.41	53,025	
PW401	**8/06/2021**	18.2	7.28	5.21	54,562	
PW401	**30/08/2021**	17.3	8.1	6.31	52,291	67.9
PW401	**11/01/2022**	23.9	7.99	2.43	56,084	

		Field Parameters				
		Temperature (Field)	pH (Field)	DO (Field)	Electrical Conductivity (field)	Redox Potential (Field)
		°C	pH Units	mg/L	µS/cm	mV
Location Code	**Date**					
PW401	**14/03/2022**	25.9	7.81	3.28	56,361	64.5
PW401	**7/06/2022**	18.1	7.92	11.61	43,560	26.3
PW401	**7/09/2022**	15.8	8.19	7.71	53,391	112.9
PW405	**14/01/2020**	26.6	7.64	2.84	63,309	-140.2
PW405	**1/04/2020**	22.2	7.1	1.45	48,229	-91.9
PW405	**22/07/2020**	14.8		6.75	17,134	26.1
PW405	**21/09/2020**	17.1	7.74	1.3	56,882	
PW405	**15/12/2020**	22.1	7.61	0.58	56,353	
PW405	**15/03/2021**	26.7	7.52	1.93	61,893	
PW405	**10/06/2021**	19.2	7.9	5.01	14,825	
PW405	**31/08/2021**	19.1	7.8	1.63	51,865	-139
PW405	**14/01/2022**	24.9	7.77	0.65	55,012	
PW405	**16/03/2022**	25.6	7.7	2.64	59,870	44.4
PW405	**7/06/2022**	13.4	7.83	2.37		53.6
PW405	**7/09/2022**	12.6	7.89	6.43	52,883	123
PW407	**14/01/2020**	26.2	7.62	4.62	59,344	-124.9
PW407	**1/04/2020**	26.2	7.63	1.05	21,748	-30.3
PW407	**22/07/2020**	14.4		5.87	17,196	18.9
PW407	**21/09/2020**	18.3	7.87	1.41	57,061	
PW407	**15/12/2020**	24.3	7.55	0.46	58,616	
PW407	**15/03/2021**	25.8	7.88	4.61	56,611	
PW407	**10/06/2021**	18.8	7.94	5.41	25,729	
PW407	**31/08/2021**	18.6	7.81	1.16	52,860	-136.7
PW407	**14/01/2022**	24.9	7.73	0.78	55,551	
PW407	**16/03/2022**	25.6	7.8	2.12	57,626	13.9
PW407	**7/06/2022**	14.8	7.67	2.05		27.1
PW407	**7/09/2022**	14.4	7.74	3.59	43,012	26.8
PW409	**14/01/2020**	28	7.47	3.44	34,189	-199
PW409	**1/04/2020**	23.7	7.33	1.15	53,391	-8.7
PW409	**21/07/2020**	14	7.81	6.32	41,000	14.1
PW409	**22/09/2020**	17.7	7.8	1.18	56,086	
PW409	**15/12/2020**	22.4	7.65	0.41	56,691	
PW409	**17/03/2021**	30.7	7.57	3.34	59,270	
PW409	**10/06/2021**	18.2	8.1	4.24	53,924	
PW409	**31/08/2021**	18.9	7.81	1.58	53,167	-144.8
PW409	**14/01/2022**	25.2	7.82	0.7	56,703	
PW409	**16/03/2022**	24.6	7.61	3.56	47,677	32.9
PW409	**7/06/2022**	14.3	7.84	4.14		47.2
PW409	**6/09/2022**	17.4	7.58	1.53	46,427	-119.8
PW411	**14/01/2020**	26.2	7.61	5.19	58,636	-80.7
PW411	**1/04/2020**	21.7	7.41	2	33,361	-121.3
PW411	**21/07/2020**	14.5	8.03	7.73	22,957	39.1
PW411	**22/09/2020**	18	7.82	1.1	56,881	
PW411	**15/12/2020**	23.6	7.73	0.85	56,869	
PW411	**18/03/2021**	25.5	7.6	3.71	57,559	
PW411	**9/06/2021**	14.8	7.85	4.07	54,743	
PW411	**1/09/2021**	15.9	7.83	5.81	52,558	-154.2
PW411	**14/01/2022**	24.9	7.85	1.49	55,690	
PW411	**16/03/2022**	25.2	7.79	2.45	58,040	45.1
PW411	**7/06/2022**	15	7.9	4.03		84.2
PW411	**6/09/2022**	16.9	7.79	5.58	41,241	-1.9
PW413	**14/01/2020**	26.7	7.6	4.48	32,515	-157.2
PW413	**1/04/2020**	22.8	7.42	1.45	31,446	-13.4
PW413	**21/07/2020**	13.8	7.36	6.07	43,485	45.9
PW413	**22/09/2020**	19	7.86	3.35	57,590	
PW413	**15/12/2020**	22.9	7.7	0.44	56,487	
PW413	**18/03/2021**	24.1	7.67	3.31	59,350	
PW413	**9/06/2021**	15.1	7.77	4.56	54,691	
PW413	**1/09/2021**	16.1	8.03	6.09	5,103	104.6
PW413	**14/01/2022**	25	7.86	1.9	58,987	
PW413	**16/03/2022**	25	7.79	2.74	57,594	39.2
PW413	**7/06/2022**	14.8	7.89	4.46		64.8
PW413	**6/09/2022**	16.5	7.74	3.44	41,255	11.6
PW415	**14/01/2020**	27.9	7.73	5.51	30,883	-70.8
PW415	**1/04/2020**	23.7	7.36	2.07	18,013	-18.1
PW415	**21/07/2020**	15.1	8.03	7.21	22,268	45.2
PW415	**22/09/2020**	19.3	7.86	1.56	57,521	
PW415	**15/12/2020**	23.7	7.66	0.99	57,175	
PW415	**18/03/2021**	24.9	7.86	3.78	39,900	
PW415	**9/06/2021**	15.1	7.83	5.52	54,827	
PW415	**1/09/2021**	16.6	7.98	6.27	52,152	87.4
PW415	**14/01/2022**	25.2	7.94	1.64	57,414	
PW415	**16/03/2022**	25.8	7.71	3.37	48,341	9.5
PW415	**7/06/2022**	15.3	7.93	4.12		68.1
PW415	**6/09/2022**	17.1	7.76	3.1	41,952	24.8

Monitoring Location	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description
SD304	11/01/2022	0089_SD304_220111	0.4	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, Pale grey sandy with seaweed frag, slight odour
SD304	18/03/2022	0089_SD304_220318	0.7	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour
SD304	8/06/2022	0089_SD304_220608	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD304	5/09/2022	0089_SD304_220905	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace organics
SD306	13/01/2022	0089_SD306_220113	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour
SD306	16/03/2022	0089_SD306_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular
SD306	7/06/2022	0089_SD306_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, sandy suldidic odour present
SD306	6/09/2022	0089_SD306_220906	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand, Shell fragments
SD307	13/01/2022	0089_SD307_220113	0.9	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour
SD307	16/03/2022	0089_SD307_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular
SD307	7/06/2022	0089_SD307_220607	0.7	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD307	6/09/2022	0089_SD307_220906	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand, Shell fragments
SD308	13/01/2022	0089_SD308_220113	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	No odour Sandy
SD308	16/03/2022	0089_SD308_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular
SD308	7/06/2022	0089_SD308_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour
SD308	6/09/2022	0089_SD308_220906	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand, Shell fragments
SD314	13/01/2022	0089_SD314_220113	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy
SD314	16/03/2022	0089_SD314_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular
SD314	7/06/2022	0089_SD314_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD314	6/09/2022	0089_SD314_220906	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand, Shell fragments
SD315	13/01/2022	0089_SD315_220113	1	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour
SD315	16/03/2022	0089_SD315_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular
SD315	7/06/2022	0089_SD315_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD315	6/09/2022	0089_SD315_220906	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Yellow sand
SD316	13/01/2022	0089_SD316_220113	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour
SD316	16/03/2022	0089_SD316_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand with coarse limestone grains, poorly sorted , sub angular
SD316	7/06/2022	0089_SD316_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour
SD316	6/09/2022	0089_SD316_220906	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand, Shell fragments
SD329	10/01/2022	0089_SD329_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD329	15/03/2022	0089_SD329_220315	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige and grey coarse grained sand, poorly sorted, sub angular
SD329	8/06/2022	0089_SD329_220608	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD329	5/09/2022	0089_SD329_220905	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD330	10/01/2022	0089_SD330_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD330	15/03/2022	0089_SD330_220315	0.9	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand, poorly sorted, sub angular
SD330	8/06/2022	0089_SD330_220608	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD330	5/09/2022	0089_SD330_220905	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD331	10/01/2022	0089_SD331_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD331	15/03/2022	0089_SD331_220315	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Beige sand, coarse grained, no odour
SD331	8/06/2022	0089_SD331_220608	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD331	5/09/2022	0089_SD331_220905	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD335	10/01/2022	0089_SD335_220110	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, Sandy, no odour
SD335	14/03/2022	0089_SD335_220314	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, coarse grained, trace shell fragments, no odour
SD335	7/06/2022	0089_SD335_220607	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Gery sand
SD335	5/09/2022	0089_SD335_220905	0.2	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace organics
SD340	10/01/2022	0089_SD340_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, sandy, no odour
SD340	14/03/2022	0089_SD340_220314	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour, coarse grained, sand, poorly sorted
SD340	7/06/2022	0089_SD340_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD340	5/09/2022	0089_SD340_220905	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, sub angular to sub rounded, beige
SD341	10/01/2022	0089_SD341_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	
SD341	14/03/2022	0089_SD341_220314	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, coarse grained, trace organics, no odour
SD341	7/06/2022	0089_SD341_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD341	5/09/2022	0089_SD341_220905	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, beige mottled with grey, trace organics
SD345	10/01/2022	0089_SD345_220110	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Brown,grey sandy with seaweed fragments, slight sulfidic odour
SD345	14/03/2022	0089_SD345_220314	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy, trace organics no odour, poorly sorted
SD345	7/06/2022	0089_SD345_220607	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey white
SD345	5/09/2022	0089_SD345_220905	0.1	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD346	12/01/2022	0089_SD346_220112	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy slight organic odour.
SD346	18/03/2022	0089_SD346_220318	0.7	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy with seaweed
SD346	8/06/2022	0089_SD346_220608	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy seaweed, no odour
SD346	6/09/2022	0089_SD346_220906	0.1	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace organics
SD350	11/01/2022	0089_SD350_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour
SD350	14/03/2022	0089_SD350_220314	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Coarse grained sub angular beige sand
SD350	7/06/2022	0089_SD350_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse sand
SD350	7/09/2022	0089_SD350_220907	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD351	11/01/2022	0089_SD351_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour
SD351	14/03/2022	0089_SD351_220314	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Coarse grained sub angular beige sand
SD351	7/06/2022	0089_SD351_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse sand
SD351	7/09/2022	0089_SD351_220907	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD352	11/01/2022	0089_SD352_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour
SD352	14/03/2022	0089_SD352_220314	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Coarse grained sub angular beige sand
SD352	7/06/2022	0089_SD352_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse sand
SD352	7/09/2022	0089_SD352_220907	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD356	10/01/2022	0089_SD356_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD356	15/03/2022	0089_SD356_220315	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Beige sand, coarse grained, no odour
SD356	8/06/2022	0089_SD356_220608	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	greu sand
SD356	5/09/2022	0089_SD356_220905	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD357	10/01/2022	0089_SD357_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD357	15/03/2022	0089_SD357_220315	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Beige sand, coarse grained, no odour
SD357	8/06/2022	0089_SD357_220608	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD357	5/09/2022	0089_SD357_220905	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD358	10/01/2022	0089_SD358_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD358	15/03/2022	0089_SD358_220315	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige and grey coarse grained sand, poorly sorted, sub angular
SD358	8/06/2022	0089_SD358_220608	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD358	5/09/2022	0089_SD358_220905	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey coarse sand
SD362	10/01/2022	0089_SD362_220110	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	No odour
SD362	14/03/2022	0089_SD362_220314	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Sand Coarse grained, trace organics, poorly sorted
SD362	7/06/2022	0089_SD362_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD362	5/09/2022	0089_SD362_220905	0.2	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, grey, trace organics
SD363	10/01/2022	0089_SD363_220110	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour
SD363	14/03/2022	0089_SD363_220314	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, coarse grained, grey, trace organics

Monitoring Location	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description
SD363	7/06/2022	0089_SD363_220607	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD363	5/09/2022	0089_SD363_220905	0.1	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, beige mottled grey, trace organics
SD364	10/01/2022	0089_SD364_220110	0.4	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, sandy, no odour
SD364	14/03/2022	0089_SD364_220314	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Beige, coarse grained sand, trace shell fragments, no odour
SD364	7/06/2022	0089_SD364_220607	0.7	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD364	5/09/2022	0089_SD364_220905	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace organics
SD367	11/01/2022	0089_SD367_220111	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, grey, sandy with seaweed fragments, slight sulfidic odour
SD367	14/03/2022	0089_SD367_220314	0.4	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy trace organics slight organic odour
SD367	7/06/2022	0089_SD367_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey
SD367	5/09/2022	0089_SD367_220905	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD368	11/01/2022	0089_SD368_220111	0.4	Direct_into_Bottle,Shovel_Trowel	Wet	Pale brown, sandy with seaweed fragments, slight sulfidic odour
SD368	18/03/2022	0089_SD368_220318	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour
SD368	8/06/2022	0089_SD368_220608	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD368	5/09/2022	0089_SD368_220905	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to medium grained, beige, trace organics
SD369	10/01/2022	0089_SD369_220110	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy with seaweed frag, no odour
SD369	14/03/2022	0089_SD369_220314	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, coarse grained, no odour, poorly sorted
SD369	7/06/2022	0089_SD369_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey white
SD369	5/09/2022	0089_SD369_220905	0.1	Direct_into_Bottle,Shovel_Trowel	Wet	Grey. No odour
SD374	13/01/2022	0089_SD374_220113	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour Sandy
SD374	16/03/2022	0089_SD374_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand, poorly sorted, sub angular
SD374	9/06/2022	0089_SD374_220609	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, beige
SD374	6/09/2022	0089_SD374_220906	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, well graded, trace shells
SD375	13/01/2022	0089_SD375_220113	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour
SD375	16/03/2022	0089_SD375_220316	0.9	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand, poorly sorted, sub angular
SD375	9/06/2022	0089_SD375_220609	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Beige sand
SD375	6/09/2022	0089_SD375_220906	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace organics
SD378	13/01/2022	0089_SD378_220113	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Sandy no odour
SD378	16/03/2022	0089_SD378_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand, poorly sorted, sub angular
SD378	9/06/2022	0089_SD378_220609	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD378	6/09/2022	0089_SD378_220906	0.1	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace shells
SD380	11/01/2022	0089_SD380_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour
SD380	14/03/2022	0089_SD380_220314	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Coarse grained sub angular beige sand
SD380	7/06/2022	0089_SD380_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse sand
SD381	11/01/2022	0089_SD381_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour
SD381	14/03/2022	0089_SD381_220314	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Coarse grained sub angular beige sand
SD381	7/06/2022	0089_SD381_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse sand
SD381	7/09/2022	0089_SD381_220907	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD401	11/01/2022	0089_SD401_220111	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	No odour
SD401	14/03/2022	0089_SD401_220314	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Coarse grained sub angular beige sand
SD401	7/06/2022	0089_SD401_220607		Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse sand
SD401	7/09/2022	0089_SD401_220907	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD405	14/01/2022	0089_SD405_220114	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, sandy, no odour
SD405	16/03/2022	0089_SD405_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand, poorly sorted, sub angular
SD405	7/06/2022	0089_SD405_220607	0.7	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD405	7/09/2022	0089_SD405_220907	0.5	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD407	14/01/2022	0089_SD407_220114	1	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour
SD407	16/03/2022	0089_SD407_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand, poorly sorted, sub angular
SD407	7/06/2022	0089_SD407_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD407	7/09/2022	0089_SD407_220907	0.3	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, medium to coarse grained, beige, trace shell matter
SD409	14/01/2022	0089_SD409_220114	0.9	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour
SD409	16/03/2022	0089_SD409_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige grey coarse grained sand, poorly sorted, sub angular
SD409	7/06/2022	0089_SD409_220607	0.6	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy. No odour
SD409	6/09/2022	0089_SD409_220906	0.1	Direct_into_Bottle,Shovel_Trowel	Wet	Sand, fine to med grained, well graded, trace organics
SD411	14/01/2022	0089_SD411_220114	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour
SD411	16/03/2022	0089_SD411_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige grey coarse grained sand, poorly sorted, sub angular
SD411	7/06/2022	0089_SD411_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD411	6/09/2022	0089_SD411220906	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Grey sand
SD413	14/01/2022	0089_SD413_220114	0.9	Direct_into_Bottle,Shovel_Trowel	Wet	Grey, sandy, no odour
SD413	16/03/2022	0089_SD413_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige grey coarse grained sand, poorly sorted , sub angular
SD413	7/06/2022	0089_SD413_220607	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD413	6/09/2022	0089_SD413_220906	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Yellow sand
SD415	14/01/2022	0089_SD415_220114	0.7	Direct_into_Bottle,Shovel_Trowel	Wet	Brown, sandy, no odour
SD415	16/03/2022	0089_SD415_220316	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Beige coarse grained sand, poorly sorted , sub angular
SD415	7/06/2022	0089_SD415_220607	0.7	Direct_into_Bottle,Shovel_Trowel	Wet	Brown sandy no odour
SD415	6/09/2022	0089_SD415_220906	0.8	Direct_into_Bottle,Shovel_Trowel	Wet	Yellow sand

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW109	3/08/2017	4.12	3.461	0.326	
MW109	20/09/2017	4.13	3.471	0.316	
MW109	18/10/2017	4.105	3.446	0.341	
MW109	16/11/2017	4.18	3.521	0.266	
MW109	16/11/2017	4.18	3.521	0.266	
MW109	6/12/2017	4.205	3.546	0.241	
MW109	18/01/2018	4.12	3.461	0.326	
MW109	16/12/2019	4.195	3.536	0.251	
MW109	30/03/2020	4.101	3.442	0.345	
MW109	15/07/2020	3.885	3.226	0.561	
MW109	21/09/2020	4.151	3.492	0.295	
MW109	21/09/2020	4.151	3.492	0.295	
MW109	14/12/2020	4.115	3.456	0.331	
MW109	16/03/2021	4.022	3.363	0.424	Clear
MW109	8/06/2021	4.03	3.371	0.416	
MW109	30/08/2021	4.12	3.461	0.326	
MW109	16/11/2021	4.12	3.461	0.326	Hand bailed, hydra sleeve not at right depth. Roots.
MW109	10/01/2022	5.5	5.5	-1.054	Dry
MW109	14/03/2022	4.02	3.361	0.426	
MW109	7/06/2022	3.99	3.331	0.456	
MW109	5/09/2022	4.015	3.356	0.431	
MW109	13/03/2023	4.12	3.461	0.326	
MW112	3/08/2017	3.47	3.527	0.503	
MW112	20/09/2017	3.51	3.567	0.463	
MW112	18/10/2017	3.46	3.517	0.513	
MW112	16/11/2017	3.53	3.587	0.443	
MW112	16/11/2017	3.53	3.587	0.443	
MW112	6/12/2017	3.525	3.582	0.448	
MW112	18/01/2018	3.475	3.532	0.498	
MW112	8/01/2020	3.61	3.667	0.363	
MW112	30/03/2020	3.46	3.517	0.513	
MW112	15/07/2020	3.315	3.372	0.658	
MW112	21/09/2020	3.456	3.513	0.517	
MW112	21/09/2020	3.456	3.513	0.517	
MW112	14/12/2020	3.46	3.517	0.513	
MW112	16/03/2021	3.435	3.492	0.538	Clear,Green
MW112	8/06/2021	3.96	4.017	0.013	
MW112	30/08/2021	3.46	3.517	0.513	
MW112	10/01/2022	3.5	3.557	0.473	
MW112	14/03/2022	3.39	3.447	0.583	
MW112	7/06/2022	3.385	3.442	0.588	
MW112	5/09/2022	3.355	3.412	0.618	
MW112	13/03/2023	3.485	3.542	0.488	
MW120	3/08/2017	4.04	3.474	0.369	
MW120	20/09/2017	4.065	3.499	0.344	
MW120	18/10/2017	4.02	3.454	0.389	
MW120	16/11/2017	4.12	3.554	0.289	
MW120	16/11/2017	4.12	3.554	0.289	
MW120	6/12/2017	4.12	3.554	0.289	
MW120	18/01/2018	4.05	3.484	0.359	
MW120	4/11/2019	4.195	3.629	0.214	
MW120	16/12/2019	4.13	3.564	0.279	
MW120	30/03/2020	4.024	3.458	0.385	
MW120	15/07/2020	3.82	3.254	0.589	
MW120	21/09/2020	5.5	5.5	-1.091	Dry
MW120	21/09/2020	5.5	5.5	-1.091	Dry
MW120	14/12/2020	4.04	3.474	0.369	
MW120	16/03/2021	3.42	2.854	0.989	Cloudy
MW120	8/06/2021	3.96	3.394	0.449	
MW120	30/08/2021	4.06	3.494	0.349	
MW120	15/11/2021	4.036	3.47	0.373	
MW120	16/11/2021	4.06	3.494	0.349	
MW120	10/01/2022	3.34	2.774	1.069	
MW120	14/03/2022	3.946	3.38	0.463	
MW120	7/06/2022	3.955	3.389	0.454	
MW120	5/09/2022	3.947	3.381	0.462	
MW120	13/03/2023	4.075	3.509	0.334	
MW121	3/08/2017	3.315	3.315	0.385	
MW121	20/09/2017	3.365	3.365	0.335	
MW121	18/10/2017	3.31	3.31	0.39	
MW121	16/11/2017	3.405	3.405	0.295	
MW121	16/11/2017	3.405	3.405	0.295	
MW121	6/12/2017	3.39	3.39	0.31	
MW121	18/01/2018	3.305	3.305	0.395	
MW121	5/11/2019	3.47	3.47	0.23	
MW121	16/12/2019	3.42	3.42	0.28	
MW121	30/03/2020	4.29	4.29	-0.59	
MW121	15/07/2020	3.165	3.165	0.535	
MW121	21/09/2020	3.356	3.356	0.344	
MW121	21/09/2020	3.356	3.356	0.344	
MW121	14/12/2020	3.4	3.4	0.3	
MW121	16/03/2021	6.22	6.22	-2.52	Cloudy
MW121	8/06/2021	3.25	3.25	0.45	
MW121	30/08/2021	4.275	4.275	-0.575	
MW121	15/11/2021	3.33	3.33	0.37	
MW121	10/01/2022	3.36	3.36	0.34	
MW121	14/03/2022	3.25	3.25	0.45	
MW121	7/06/2022	3.235	3.235	0.465	
MW121	5/09/2022	3.225	3.225	0.475	Hydrasleeve broke during recovery
MW121	13/03/2023	3.36	3.36	0.34	
MW123	3/08/2017	6.225	5.538	0.395	
MW123	20/09/2017	6.34	5.653	0.28	
MW123	18/10/2017	6.295	5.608	0.325	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW123	16/11/2017	6.35	5.663	0.27	
MW123	16/11/2017	6.35	5.663	0.27	
MW123	6/12/2017	6.335	5.648	0.285	
MW123	18/01/2018	6.273	5.586	0.347	
MW123	16/12/2019	6.39	5.703	0.23	
MW123	30/03/2020				Dry
MW123	15/07/2020				DRY
MW123	21/09/2020				DRY
MW123	14/12/2020	6.27	5.583	0.35	
MW123	16/03/2021	7.34	6.653	-0.72	Cloudy
MW123	8/06/2021	6.18	5.493	0.44	
MW123	30/08/2021	6.265	5.578	0.355	
MW123	15/11/2021	6.321	5.634	0.299	
MW123	16/11/2021	6.265	5.578	0.355	Hand bailed. 3 readings taken. Slight hydrocarbon odour
MW123	10/01/2022	6.27	5.583	0.35	
MW123	14/03/2022	6.23	5.543	0.39	
MW123	7/06/2022	6.18	5.493	0.44	
MW123	5/09/2022	6.17	5.483	0.45	
MW123	13/03/2023	6.305	5.618	0.315	
MW124	3/08/2017	1.745	0.997	0.154	
MW124	20/09/2017	1.716	0.968	0.183	MW124-S, H2S ODOUR, GREY STAINING
MW124	18/10/2017	1.76	1.012	0.139	MW124-S
MW124	16/11/2017	1.874	1.126	0.025	Slight H2S odour, no staining
MW124	6/12/2017	1.972	1.224	-0.073	MW124-S, sl tannin appearance sl H2S odour
MW124	18/01/2018	1.76	1.012	0.139	MW124-S, sl tannin appearance sl H2S odour
MW124	9/01/2020	1.992	1.244	-0.093	
MW124	30/03/2020	1.676	0.928	0.223	
MW124	15/07/2020	1.46	0.712	0.439	
MW124	22/09/2020	1.893	1.145	0.006	
MW124	14/12/2020	1.79	1.042	0.109	
MW124	15/03/2021	1.635	0.887	0.264	Clear
MW124	8/06/2021	1.63	0.882	0.269	
MW124	30/08/2021	1.78	1.032	0.119	
MW124	16/11/2021	1.78	1.032	0.119	
MW124	10/01/2022	1.94	1.192	-0.041	
MW124	14/03/2022	1.71	0.962	0.189	
MW124	7/06/2022	1.625	0.877	0.274	
MW124	5/09/2022	1.6	0.852	0.299	
MW124	13/03/2023	1.85	1.102	0.049	
MW125	3/08/2017	1.722	1.053	0.16	
MW125	20/09/2017	1.738	1.069	0.144	MW125-S, H2S ODOUR, NO STAINING
MW125	18/10/2017	1.73	1.061	0.152	MW125-S, v slight organic odour, no sheen
MW125	16/11/2017	1.858	1.189	0.024	H2S ODOUR
MW125	16/11/2017	1.858	1.189	0.024	H2S ODOUR
MW125	6/12/2017	1.918	1.249	-0.036	MW125-S, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	18/01/2018	1.722	1.053	0.16	MW125-S, SL H2S ODOUR, SL TANNIN APPEARANCE
MW125	9/01/2020	1.97	1.301	-0.088	
MW125	30/03/2020	1.82	1.151	0.062	
MW125	15/07/2020	1.44	0.771	0.442	
MW125	22/09/2020	1.868	1.199	0.014	
MW125	22/09/2020	1.868	1.199	0.014	
MW125	14/12/2020	1.76	1.091	0.122	
MW125	15/03/2021	1.73	1.061	0.152	Clear
MW125	8/06/2021	1.63	0.961	0.252	
MW125	30/08/2021	1.77	1.101	0.112	
MW125	16/11/2021	1.77	1.101	0.112	
MW125	10/01/2022	1.9	1.231	-0.018	
MW125	14/03/2022	1.685	1.016	0.197	
MW125	7/06/2022	1.63	0.961	0.252	
MW125	5/09/2022	1.58	0.911	0.302	
MW125	13/03/2023	1.79	1.121	0.092	
MW126	3/08/2017	1.785	1.101	0.163	
MW126	20/09/2017	1.818	1.134	0.13	MW126-S, H2S ODOUR, GREY STAINING
MW126	18/10/2017	1.77	1.086	0.178	MW126-S, slight organic odour, no sheen
MW126	16/11/2017	1.926	1.242	0.022	H2S odour, Sl Grey Staining
MW126	6/12/2017	1.922	1.238	0.026	MW126-S, H2S ODOUR, SL TANNIN APPEARANCE
MW126	18/01/2018	1.74	1.056	0.208	MW126-S, H2S ODOUR, SL TANNIN APPEARANCE
MW126	8/01/2020	1.73	1.046	0.218	
MW126	31/03/2020	1.866	1.182	0.082	
MW126	15/07/2020	1.54	0.856	0.408	
MW126	22/09/2020	1.913	1.229	0.035	
MW126	22/09/2020	1.913	1.229	0.035	
MW126	14/12/2020	1.79	1.106	0.158	
MW126	15/03/2021	1.825	1.141	0.123	Clear
MW126	8/06/2021	1.67	0.986	0.278	
MW126	30/08/2021	1.79	1.106	0.158	
MW126	16/11/2021	1.79	1.106	0.158	
MW126	10/01/2022	1.9	1.216	0.048	Slight sulfur odour
MW126	14/03/2022	1.74	1.056	0.208	
MW126	7/06/2022	1.71	1.026	0.238	
MW126	5/09/2022	1.64	0.956	0.308	
MW126	13/03/2023	1.85	1.166	0.098	
MW127	3/08/2017	1.6	0.889	0.171	
MW127	20/09/2017	1.639	0.928	0.132	MW127-S
MW127	18/10/2017	1.59	0.879	0.181	MW127-S, slight organic odour, no sheen
MW127	16/11/2017	1.741	1.03	0.03	H2S odour, grey staining probes + Bucket
MW127	6/12/2017	1.717	1.006	0.054	MW127-S, H2S ODOUR SL TANNIN
MW127	18/01/2018	1.565	0.854	0.206	MW127-S, H2S ODOUR SL TANNIN
MW127	8/01/2020	1.77	1.059	0.001	
MW127	31/03/2020	1.505	0.794	0.266	
MW127	15/07/2020	1.36	0.649	0.411	
MW127	22/09/2020	1.721	1.01	0.05	
MW127	22/09/2020	1.721	1.01	0.05	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW127	14/12/2020	1.615	0.904	0.156	
MW127	15/03/2021	1.63	0.919	0.141	Clear
MW127	8/06/2021	1.505	0.794	0.266	
MW127	30/08/2021	1.59	0.879	0.181	
MW127	16/11/2021	1.59	0.879	0.181	
MW127	10/01/2022	1.81	1.099	-0.039	Slight sulfur odour
MW127	14/03/2022	1.71	0.999	0.061	
MW127	7/06/2022	1.51	0.799	0.261	
MW127	5/09/2022	1.48	0.769	0.291	
MW127	13/03/2023	1.72	1.009	0.051	
MW128	3/08/2017	4.185	3.651	0.352	
MW128	20/09/2017	4.305	3.771	0.232	MW128-S
MW128	18/10/2017	4.27	3.736	0.267	MW128-S, NO ODOUR&SHEEN
MW128	16/11/2017	4.333	3.799	0.204	no o/s
MW128	16/11/2017	4.333	3.799	0.204	no o/s
MW128	6/12/2017	4.314	3.78	0.223	MW128-S, NO O/S
MW128	18/01/2018	4.188	3.654	0.349	MW128-S, NO O/S
MW128	21/11/2019				Dry
MW128	16/12/2019				Dry
MW128	30/03/2020				Dry
MW128	15/07/2020				DRY
MW128	21/09/2020				Dry
MW128	21/09/2020				Dry
MW128	14/12/2020				DRY
MW128	16/03/2021				DRY
MW128	8/06/2021				Dry at 3.7
MW128	30/08/2021				Dry
MW128	16/11/2021				Dry
MW128	10/01/2022				Dry
MW128	14/03/2022				Dry
MW128	7/06/2022	4.31	3.776	0.227	Unblocked
MW128	5/09/2022	4.305	3.771	0.232	
MW128	13/03/2023				Dry
MW139	1/08/2017	1.8	1.847	0.473	
MW139	19/09/2017	2.09	2.137	0.183	MW139-S
MW139	17/10/2017	2.075	2.122	0.198	MW139-S
MW139	20/11/2017	2.06	2.107	0.213	no o/s
MW139	20/11/2017	2.06	2.107	0.213	no o/s
MW139	4/12/2017	2.14	2.187	0.133	MW139-S
MW139	17/01/2018	1.795	1.842	0.478	MW139-S
MW139	15/11/2019	2.178	2.225	0.095	
MW139	8/01/2020	2.22	2.267	0.053	
MW139	30/03/2020	2.034	2.081	0.239	
MW139	20/07/2020	1.82	1.867	0.453	
MW139	22/09/2020	2.041	2.088	0.232	
MW139	22/09/2020	2.041	2.088	0.232	
MW139	14/12/2020	2.05	2.097	0.223	
MW139	16/03/2021	2	2.047	0.273	Clear
MW139	8/06/2021	1.884	1.931	0.389	
MW139	31/08/2021	1.975	2.022	0.298	
MW139	18/11/2021	2.041	2.088	0.232	
MW139	10/01/2022	2.1	2.147	0.173	
MW139	15/03/2022	2.004	2.051	0.269	
MW139	8/06/2022	1.89	1.937	0.383	
MW139	5/09/2022	1.895	1.942	0.378	
MW139	15/03/2023	2.108	2.155	0.165	
MW141	1/08/2017	2.675	2.35	0.35	
MW141	19/09/2017	2.84	2.515	0.185	MW141-S
MW141	17/10/2017	2.7	2.375	0.325	MW141-S
MW141	20/11/2017	2.83	2.505	0.195	no o/s, no staining
MW141	4/12/2017	2.9	2.575	0.125	MW141-S
MW141	17/01/2018	2.74	2.415	0.285	MW141-S
MW141	15/11/2019	2.946	2.621	0.079	
MW141	8/01/2020	2.98	2.655	0.045	
MW141	30/03/2020	2.806	2.481	0.219	
MW141	20/07/2020	2.655	2.33	0.37	
MW141	23/09/2020	2.859	2.534	0.166	
MW141	23/09/2020	2.859	2.534	0.166	
MW141	14/12/2020	2.78	2.455	0.245	
MW141	16/03/2021	2.76	2.435	0.265	Cloudy, sulfur odour
MW141	8/06/2021	1.673	1.348	1.352	
MW141	31/08/2021	2.725	2.4	0.3	
MW141	18/11/2021	2.826	2.501	0.199	
MW141	10/01/2022	2.89	2.565	0.135	
MW141	15/03/2022	2.726	2.401	0.299	
MW141	8/06/2022	2.66	2.335	0.365	
MW141	5/09/2022	2.66	2.335	0.365	
MW141	15/03/2023	2.899	2.574	0.126	
MW142	1/08/2017	2.28	1.608	0.293	
MW142	19/09/2017	2.397	1.725	0.176	MW142-S
MW142	17/10/2017	2.15	1.478	0.423	MW142-S NO O/S
MW142	20/11/2017	2.434	1.762	0.139	no o/s
MW142	4/12/2017	2.478	1.806	0.095	MW142-S, NO O/S
MW142	17/01/2018	2.308	1.636	0.265	MW142-S, NO O/S
MW142	15/11/2019	2.539	1.867	0.034	
MW142	8/01/2020	2.13	1.458	0.443	
MW142	30/03/2020	2.391	1.719	0.182	
MW142	20/07/2020	2.18	1.508	0.393	
MW142	23/09/2020	2.463	1.791	0.11	
MW142	14/12/2020	2.36	1.688	0.213	
MW142	16/03/2021	2.32	1.648	0.253	Yellow
MW142	8/06/2021	2.275	1.603	0.298	
MW142	30/08/2021	2.338	1.666	0.235	
MW142	10/01/2022	2.49	1.818	0.083	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW142	15/03/2022	2.275	1.603	0.298	
MW142	8/06/2022	2.22	1.548	0.353	
MW142	5/09/2022	2.295	1.623	0.278	Bore now 50cm from edge of sand dune
MW142	15/03/2023	2.47	1.798	0.103	
MW147	1/08/2017	3.05	2.577	0.373	
MW147	19/09/2017	3.205	2.732	0.218	MW147-S
MW147	17/10/2017	3.045	2.572	0.378	MW147-S, ROOT FRAGS IN START UP
MW147	20/11/2017	3.19	2.717	0.233	some suspended solids @ 1min, cleared during purge, no o/s, grey staining on probes
MW147	20/11/2017	3.19	2.717	0.233	NO O/S, GREY STAIN ON PROBES
MW147	4/12/2017	3.27	2.797	0.153	MW147-S
MW147	17/01/2018	3.125	2.652	0.298	MW147-S
MW147	15/11/2019				Dry
MW147	8/01/2020				Dry
MW147	30/03/2020	3.008	2.535	0.415	Bore dry - no sample able to be taken
MW147	20/07/2020	2.91	2.437	0.513	
MW147	23/09/2020				Dry
MW147	14/12/2020				Dry
MW147	16/03/2021				Dry
MW147	8/06/2021				DRY
MW147	30/08/2021				Dry
MW147	18/11/2021	3.197	2.724	0.226	
MW147	10/01/2022				Dry, difficult to access due to vegetation overgrown
MW147	15/03/2022				
MW147	8/06/2022				Dry/blocked at 2.96m
MW147	5/09/2022				Blocked at 2.5m
MW147	14/11/2022				Root blockage at 3.440 m bTOC unable to unblock.
MW147	15/03/2023	3.071	2.598	0.352	
MW149	1/08/2017	2.02	1.442	0.283	
MW149	19/09/2017	2.087	1.509	0.216	MW149-S
MW149	17/10/2017	1.731	1.153	0.572	MW149-S, NO O/S
MW149	4/12/2017	2.223	1.645	0.08	MW149-S, NO O/S
MW149	17/01/2018	2.047	1.469	0.256	MW149-S, NO O/S
MW149	15/11/2019	2.266	1.688	0.037	
MW149	8/01/2020	2.29	1.712	0.013	
MW149	30/03/2020	2.094	1.516	0.209	
MW149	20/07/2020	1.87	1.292	0.433	
MW149	23/09/2020	2.2	1.622	0.103	
MW149	14/12/2020	2.08	1.502	0.223	
MW149	16/03/2021	2.06	1.482	0.243	Clear
MW149	8/06/2021	1.975	1.397	0.328	
MW149	30/08/2021	2.066	1.488	0.237	
MW149	18/11/2021	2.173	1.595	0.13	
MW149	10/01/2022	2.21	1.632	0.093	
MW149	15/03/2022	2.026	1.448	0.277	
MW149	8/06/2022	1.91	1.332	0.393	
MW149	5/09/2022	2.02	1.442	0.283	Monument below bore casing due to beach erosion.
MW149	15/03/2023	2.056	1.478	0.247	
MW158	7/08/2017	14.16	13.629	0.381	
MW158	1/11/2019	14.26	13.729	0.281	
MW158	8/01/2020	14.34	13.809	0.201	
MW158	31/03/2020	14.18	13.649	0.361	
MW158	21/07/2020	14.125	13.594	0.416	
MW158	21/09/2020	14.123	13.592	0.418	
MW158	14/12/2020	14.14	13.609	0.401	
MW158	15/03/2021	15.82	15.82	-1.279	Clear
MW158	10/06/2021	13.991	13.46	0.55	
MW158	30/08/2021	14.58	14.049	-0.039	
MW158	16/11/2021	14.58	14.049	-0.039	
MW158	10/01/2022				Dry unable to sample
MW158	15/03/2022	14.082	13.551	0.459	
MW158	7/06/2022	13.908	13.377	0.633	
MW158	5/09/2022	14.121	13.59	0.42	
MW158	13/03/2023	14.252	13.721	0.289	
MW161	7/08/2017	16.585	15.99	0.64	
MW161	18/09/2017	16.775	16.18	0.45	
MW161	19/10/2017	16.725	16.13	0.5	
MW161	15/11/2017	16.765	16.17	0.46	
MW161	7/12/2017	16.76	16.165	0.465	
MW161	16/01/2018	16.775	16.18	0.45	
MW161	1/11/2019	16.722	16.127	0.503	
MW161	8/01/2020	16.97	16.375	0.255	
MW161	21/07/2020	16.62	16.025	0.605	
MW161	21/09/2020	16.528	15.933	0.697	
MW161	14/12/2020	16.77	16.175	0.455	
MW161	15/03/2021	16.7	16.105	0.525	Clear,Cloudy
MW161	10/06/2021	16.655	16.06	0.57	
MW161	30/08/2021	14.6	14.005	2.625	
MW161	15/11/2021	16.743	16.148	0.482	
MW161	16/11/2021	14.6	14.005	2.625	
MW161	10/01/2022	16.78	16.185	0.445	
MW161	15/03/2022	12.616	12.021	4.609	
MW161	5/05/2022	16.659	16.064	0.566	
MW161	7/06/2022	16.637	16.042	0.588	
MW161	5/09/2022	16.669	16.074	0.556	
MW161	15/11/2022	16.845	16.25	0.38	
MW161	13/03/2023	16.807	16.212	0.418	
MW166	7/08/2017	11.22	10.58	0.67	
MW166	18/09/2017	11.345	10.705	0.545	
MW166	19/10/2017	11.315	10.675	0.575	
MW166	15/11/2017	11.37	10.73	0.52	
MW166	7/12/2017	11.38	10.74	0.51	
MW166	16/01/2018	11.38	10.74	0.51	
MW166	1/11/2019	11.398	10.758	0.492	
MW166	8/01/2020	11.42	10.78	0.47	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW166	1/04/2020	11.26	10.62	0.63	
MW166	21/07/2020	11.195	10.555	0.695	
MW166	22/09/2020	11.294	10.654	0.596	
MW166	14/12/2020	11.28	10.64	0.61	
MW166	15/03/2021	11.295	10.655	0.595	
MW166	10/06/2021	12.09	11.45	-0.2	
MW166	30/08/2021	11.75	11.11	0.14	
MW166	15/11/2021	11.695	11.055	0.195	
MW166	16/11/2021	11.75	11.11	0.14	
MW166	10/01/2022	11.33	10.69	0.56	
MW166	15/03/2022	11.202	10.562	0.688	
MW166	5/05/2022	11.268	10.628	0.622	
MW166	7/06/2022	11.193	10.553	0.697	
MW166	5/09/2022	11.275	10.635	0.615	
MW166	15/11/2022	11.436	10.796	0.454	
MW166	13/03/2023	11.313	10.673	0.577	
MW171	7/08/2017	28.68	28.312	0.558	
MW171	18/09/2017	28.855	28.487	0.383	
MW171	19/10/2017	28.82	28.452	0.418	
MW171	15/11/2017	28.86	28.492	0.378	
MW171	7/12/2017	28.87	28.502	0.368	
MW171	16/01/2018	28.88	28.512	0.358	
MW171	30/10/2019	28.924	28.556	0.314	
MW171	1/04/2020	28.55	28.182	0.688	
MW171	21/07/2020	28.48	28.112	0.758	
MW171	22/09/2020	31.5	31.5	-2.262	
MW171	14/12/2020	28.55	28.182	0.688	
MW171	15/03/2021	28.55	28.182	0.688	Cloudy, sulfur odour
MW171	10/06/2021	28.392	28.024	0.846	
MW171	30/08/2021	28.6	28.232	0.638	
MW171	15/11/2021	28.789	28.421	0.449	
MW171	16/11/2021	28.6	28.232	0.638	
MW171	10/01/2022	28.64	28.272	0.598	
MW171	15/03/2022	28.451	28.083	0.787	
MW171	5/05/2022	28.53	28.162	0.708	
MW171	7/06/2022	28.341	27.973	0.897	
MW171	5/09/2022	28.538	28.17	0.7	
MW171	15/11/2022	28.91	28.542	0.328	LNAPL at observed 3.641
MW171	13/03/2023	28.325	27.957	0.913	
MW172	7/08/2017	16.3	15.718	0.472	sampled at 17.3
MW172	11/11/2019	16.438	15.856	0.334	
MW172	22/11/2019	16.521	15.939	0.251	
MW172	9/01/2020				Dry
MW172	1/04/2020				Dry
MW172	21/07/2020				DRY
MW172	22/09/2020				DRY
MW172	14/12/2020				DRY
MW172	15/03/2021				Dry
MW172	10/06/2021				Dry
MW172	30/08/2021				Dry
MW172	16/11/2021				Dry
MW172	10/01/2022				Dry
MW172	15/03/2022	26	26	-9.228	
MW172	8/06/2022	16.32	15.738	0.452	
MW172	6/09/2022	16.357	15.775	0.415	
MW172	13/03/2023	16.415	15.833	0.357	
MW173	9/08/2017	9.575	9.125	0.505	
MW173	18/09/2017	10.72	10.27	-0.64	
MW173	19/10/2017	9.665	9.215	0.415	low flow
MW173	15/11/2017	9.69	9.24	0.39	
MW173	7/12/2017	9.7	9.25	0.38	
MW173	16/01/2018	9.75	9.3	0.33	
MW173	15/11/2019	9.73	9.28	0.35	
MW173	16/01/2020	8.8	8.35	1.28	
MW173	31/03/2020	9.4	8.95	0.68	
MW173	22/07/2020	9.53	9.08	0.55	
MW173	22/09/2020				DRY
MW173	16/12/2020				DRY
MW173	16/03/2021	9.595	9.145	0.485	Clear
MW173	10/06/2021	9.471	9.021	0.609	
MW173	30/08/2021				Dry
MW173	15/11/2021	9.696	9.246	0.384	
MW173	16/11/2021				Dry
MW173	10/01/2022				Dry
MW173	15/03/2022	9.53	9.08	0.55	
MW173	4/05/2022	9.559	9.109	0.521	
MW173	8/06/2022	9.5	9.05	0.58	
MW173	5/09/2022	9.599	9.149	0.481	
MW173	18/11/2022	9.706	9.256	0.374	
MW173	13/03/2023	9.614	9.164	0.466	
MW193	8/08/2017	11.23	10.82	0.63	
MW193	18/09/2017	11.36	10.95	0.5	
MW193	19/10/2017	11.32	10.91	0.54	
MW193	15/11/2017	11.35	10.94	0.51	
MW193	7/12/2017	11.375	10.965	0.485	
MW193	16/01/2018	11.38	10.97	0.48	
MW193	28/10/2019	11.465	11.055	0.395	
MW193	8/01/2020	11.4	10.99	0.46	Bore not labelled
MW193	31/03/2020	11.19	10.78	0.67	
MW193	15/07/2020	11.1	10.69	0.76	
MW193	21/09/2020	13.5	13.5	-1.64	
MW193	21/09/2020	13.5	13.5	-1.64	
MW193	16/12/2020	11.3	10.89	0.56	
MW193	16/03/2021	11.8	11.39	0.06	Clear

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW193	10/06/2021	11.13	10.72	0.73	
MW193	30/08/2021	11.31	10.9	0.55	
MW193	16/11/2021	11.31	10.9	0.55	
MW193	10/01/2022	11.289	10.879	0.571	Grey slight odour and quite turbid
MW193	15/03/2022	11.205	10.795	0.655	
MW193	7/06/2022	10.842	10.432	1.018	
MW193	5/09/2022	11.249	10.839	0.611	
MW193	13/03/2023	11.31	10.9	0.55	
MW195D	9/08/2017	3.915	3.612	0.448	
MW195D	28/10/2019	4.175	3.872	0.188	
MW195D	8/01/2020	4.34	4.037	0.023	
MW195D	31/03/2020	4.184	3.881	0.179	
MW195D	15/07/2020	4	3.697	0.363	
MW195D	21/09/2020	4.234	3.931	0.129	
MW195D	16/12/2020	4.23	3.927	0.133	
MW195D	16/03/2021	4.17	3.867	0.193	Clear
MW195D	9/06/2021	4.055	3.752	0.308	
MW195D	30/08/2021	4.27	3.967	0.093	
MW195D	15/11/2021	4.07	3.767	0.293	
MW195D	16/11/2021	4.27	3.967	0.093	
MW195D	10/01/2022	4.26	3.957	0.103	
MW195D	15/03/2022	4.129	3.826	0.234	
MW195D	4/05/2022	3.925	3.622	0.438	
MW195D	7/06/2022	3.53	3.227	0.833	
MW195D	5/09/2022	4.146	3.843	0.217	
MW195D	18/11/2022	4.083	3.78	0.28	
MW195D	13/03/2023	4.142	3.839	0.221	
MW195S	9/08/2017	4.13	3.609	0.441	
MW195S	18/09/2017	4.274	3.753	0.297	Abundant roots present, blockage at 5.394 mbtoc
MW195S	19/10/2017	4.24	3.719	0.331	ROOTLETS PRESENT
MW195S	15/11/2017	4.265	3.744	0.306	Some roots present, no odour staining
MW195S	7/12/2017	4.27	3.749	0.301	SL ORGANIC ODOUR, TANNIN APPEARANCE
MW195S	16/01/2018	4.294	3.773	0.277	SL ORGANIC ODOUR, TANNIN APPEARANCE
MW195S	6/11/2019				Dry
MW195S	8/01/2020	4.31	3.789	0.261	Bore labelled MW292_I
MW195S	31/03/2020	4.16	3.639	0.411	
MW195S	15/07/2020	4	3.479	0.571	
MW195S	21/09/2020	4.186	3.665	0.385	
MW195S	16/12/2020	4.185	3.664	0.386	
MW195S	16/03/2021	3.8	3.279	0.771	Clear
MW195S	9/06/2021	4.055	3.534	0.516	
MW195S	30/08/2021	4.17	3.649	0.401	
MW195S	15/11/2021	4.213	3.692	0.358	
MW195S	16/11/2021	4.17	3.649	0.401	
MW195S	10/01/2022	4.21	3.689	0.361	
MW195S	15/03/2022	4.075	3.554	0.496	
MW195S	4/05/2022	4.135	3.614	0.436	
MW195S	7/06/2022	3.487	2.966	1.084	
MW195S	5/09/2022	4.09	3.569	0.481	
MW195S	15/11/2022				Damaged/bent and blocked. Unable to sample or accurately gauge due to obstructions
MW195S	13/03/2023	4.205	3.684	0.366	
MW196	8/08/2017	12.456	11.886	0.294	
MW196	29/10/2019	12.67	12.1	0.08	
MW196	16/01/2020	13.9	13.33	-1.15	
MW196	2/04/2020	12.504	11.934	0.246	Bore labelled as MB52
MW196	22/07/2020	12.4	11.83	0.35	
MW196	24/09/2020	12.535	11.965	0.215	
MW196	16/12/2020	12.5	11.93	0.25	
MW196	16/03/2021				DRY
MW196	10/06/2021	12.36	11.79	0.39	
MW196	30/08/2021	12.44	11.87	0.31	
MW196	16/11/2021	12.44	11.87	0.31	
MW196	14/03/2022	12.422	11.852	0.328	
MW196	7/06/2022				Dry
MW196	6/09/2022	12.376	11.806	0.374	
MW196	13/03/2023	12.48	11.91	0.27	
MW197	9/08/2017	1.68	1.13	0.6	
MW197	18/09/2017	2.157	1.607	0.123	
MW197	19/10/2017	2.06	1.51	0.22	NO ODOUR&SHEEN
MW197	15/11/2017	2.277	1.727	0.003	no o/s
MW197	7/12/2017	2.31	1.76	-0.03	NO ODOUR, SL TANNIN APPEARANCE
MW197	16/01/2018	2.126	1.576	0.154	NO ODOUR, SL TANNIN APPEARANCE
MW197	9/01/2020	2.43	1.88	-0.15	
MW197	31/03/2020	2.1	1.55	0.18	
MW197	15/07/2020	1.93	1.38	0.35	
MW197	24/09/2020				Dry
MW197	15/12/2020				Dry
MW197	16/03/2021	2.015	1.465	0.265	Clear
MW197	9/06/2021	1.91	1.36	0.37	
MW197	1/09/2021	2.001	1.451	0.279	
MW197	10/01/2022				Dry
MW197	14/03/2022	2.04	1.49	0.24	
MW197	7/06/2022	2.061	1.511	0.219	
MW197	5/09/2022	1.985	1.435	0.295	Eoh 2.052mbtoc
MW197	14/03/2023	2.187	1.637	0.093	
MW199	8/08/2017	11.54	10.88	0.26	
MW199	18/09/2017	11.625	10.965	0.175	
MW199	19/10/2017	11.6	10.94	0.2	
MW199	15/11/2017	11.61	10.95	0.19	
MW199	7/12/2017	11.615	10.955	0.185	
MW199	16/01/2018	11.665	11.005	0.135	
MW199	29/10/2019	11.74	11.08	0.06	
MW199	8/01/2020	11.4	10.74	0.4	
MW199	31/03/2020	8.65	7.99	3.15	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW199	15/07/2020	11.14	10.48	0.66	
MW199	21/09/2020	11.474	10.814	0.326	
MW199	16/12/2020	11.27	10.61	0.53	
MW199	16/03/2021				blocked less than 1 metre
MW199	9/06/2021				Well banded at approx 1.5m, unable to fix with steel bailer
MW199	30/08/2021	11.26	10.6	0.54	
MW199	16/11/2021	11.26	10.6	0.54	
MW199	10/01/2022	11.43	10.77	0.37	
MW199	17/03/2022	11.39	10.73	0.41	
MW199	7/06/2022	10.571	9.911	1.229	
MW199	5/09/2022	11.344	10.684	0.456	
MW199	13/03/2023	11.548	10.888	0.252	
MW200	9/08/2017	1.635	1.105	0.435	
MW200	18/09/2017	1.733	1.203	0.337	
MW200	19/10/2017	2.115	1.585	-0.045	NO ODOUR&SHEEN
MW200	15/11/2017	1.893	1.363	0.177	no o/s
MW200	7/12/2017	1.975	1.445	0.095	NO ODOUR, SL TANNIN APPEARANCE
MW200	16/01/2018	1.768	1.238	0.302	NO ODOUR, SL TANNIN APPEARANCE
MW200	11/11/2019	1.995	1.465	0.075	
MW200	9/01/2020	1.98	1.45	0.09	
MW200	31/03/2020	1.67	1.14	0.4	
MW200	15/07/2020	1.84	1.31	0.23	
MW200	24/09/2020	1.125	0.595	0.945	
MW200	15/12/2020	2.07	1.54	0	
MW200	16/03/2021	1.82	1.29	0.25	Clear
MW200	9/06/2021	1.675	1.145	0.395	
MW200	1/09/2021	1.856	1.326	0.214	
MW200	16/11/2021	1.942	1.412	0.128	
MW200	10/01/2022	2.06	1.53	0.01	
MW200	14/03/2022	1.84	1.31	0.23	
MW200	4/05/2022	2.203	1.673	-0.133	
MW200	7/06/2022	1.879	1.349	0.191	
MW200	5/09/2022	1.846	1.316	0.224	
MW200	17/11/2022	2.025	1.495	0.045	
MW200	14/03/2023	1.998	1.468	0.072	
MW202	9/08/2017	1.51	1.511	0.61	
MW202	18/09/2017	1.841	1.842	0.279	
MW202	19/10/2017	1.91	1.911	0.21	ROOTLETS PRESENT
MW202	15/11/2017	1.952	1.953	0.168	no o/s
MW202	7/12/2017	2.028	2.029	0.092	NO ODOUR, SL TANNIN APPEARANCE
MW202	16/01/2018	1.772	1.773	0.348	NO ODOUR, SL TANNIN APPEARANCE
MW202	17/01/2020				Not found
MW202	31/03/2020	1.71	1.711	0.41	
MW202	22/07/2020	1.62	1.621	0.5	
MW202	21/09/2020	1.92	1.921	0.2	
MW202	16/12/2020	1.95	1.951	0.17	
MW202	15/03/2021	1.82	1.821	0.3	Clear
MW202	10/06/2021	1.385	1.386	0.735	
MW202	30/08/2021	1.85	1.851	0.27	
MW202	16/11/2021	1.85	1.851	0.27	
MW202	12/01/2022	1.87	1.871	0.25	
MW202	8/06/2022	1.72	1.721	0.4	
MW202	5/09/2022	1.4	1.401	0.72	
MW202	13/03/2023	1.77	1.771	0.35	
MW203	9/08/2017	4.54	3.995	6.315	
MW203	8/11/2019	10.705	10.16	0.15	
MW203	8/01/2020	10.73	10.185	0.125	
MW203	31/03/2020	10.61	10.065	0.245	
MW203	15/07/2020	10.42	9.875	0.435	
MW203	22/09/2020	10.56	10.015	0.295	
MW203	16/12/2020	10.605	10.06	0.25	
MW203	16/03/2021	10.52	9.975	0.335	Clear
MW203	9/06/2021	10.44	9.895	0.415	
MW203	30/08/2021	10.43	9.885	0.425	
MW203	16/11/2021	10.43	9.885	0.425	
MW203	10/01/2022	10.52	9.975	0.335	
MW203	17/03/2022	10.54	9.995	0.315	
MW203	7/06/2022	10.41	9.865	0.445	
MW203	6/09/2022	10.38	9.835	0.475	
MW203	13/03/2023	10.58	10.035	0.275	
MW214	2/08/2017	7.76	7.144	0.315	
MW214	10/01/2020				Dry
MW214	31/03/2020				Bore Dry
MW214	22/07/2020				Dry
MW214	24/09/2020				Dry
MW214	15/12/2020				DRY
MW214	18/03/2021				Dry
MW214	9/06/2021				Dry
MW214	1/09/2021				
MW214	16/11/2021				Bore blocked by fine sediment. Unblocked and hand bailed
MW214	7/06/2022	7.67	7.054	0.405	
MW214	6/09/2022	7.545	6.929	0.53	
MW214	14/03/2023	7.726	7.11	0.349	
MW215	2/08/2017	3.555	2.912	0.239	
MW215	10/01/2020				Dry
MW215	31/03/2020				Bore Dry 3.34m
MW215	22/07/2020				Dry
MW215	22/07/2020				Dry
MW215	24/09/2020				Dry
MW215	15/12/2020				Dry
MW215	18/03/2021				Dry
MW215	9/06/2021				Dry at 3.11
MW215	1/09/2021	3.416	2.773	0.378	
MW215	7/06/2022	3.46	2.817	0.334	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW215	6/09/2022	3.308	2.665	0.486	
MW215	14/03/2023	3.542	2.899	0.252	
MW216	2/08/2017	7.945	7.194	0.384	
MW216	11/09/2017	7.91	7.159	0.419	
MW216	16/10/2017	7.905	7.154	0.424	
MW216	17/11/2017	7.92	7.169	0.409	
MW216	5/12/2017	7.97	7.219	0.359	NO O/S
MW216	15/01/2018	8.07	7.319	0.259	NO O/S
MW216	19/12/2019	7.9	7.149	0.429	
MW216	31/03/2020	7.905	7.154	0.424	
MW216	15/12/2020	7.91	7.159	0.419	
MW216	18/03/2021	8.93	8.179	-0.601	Clear
MW216	9/06/2021	7.752	7.001	0.577	
MW216	31/08/2021	7.909	7.158	0.42	
MW216	16/03/2022	7.8	7.049	0.529	
MW216	7/06/2022	7.87	7.119	0.459	
MW216	5/09/2022	7.848	7.097	0.481	
MW216	14/03/2023	7.944	7.193	0.385	
MW217	2/08/2017	8.365	7.743	0.482	
MW217	11/09/2017	8.4	7.778	0.447	
MW217	16/10/2017	8.43	7.808	0.417	
MW217	17/11/2017	8.445	7.823	0.402	
MW217	5/12/2017	8.45	7.828	0.397	NO O/S
MW217	15/01/2018	8.56	7.938	0.287	NO O/S
MW217	18/12/2019	8.49	7.868	0.357	
MW217	31/03/2020	8.438	7.816	0.409	
MW217	22/07/2020	8.31	7.688	0.537	
MW217	24/09/2020	8.458	7.836	0.389	
MW217	15/12/2020	8.42	7.798	0.427	
MW217	18/03/2021	8.43	7.808	0.417	Clear
MW217	9/06/2021	8.28	7.658	0.567	
MW217	31/08/2021	8.355	7.733	0.492	
MW217	16/11/2021	8.355	7.733	0.492	
MW217	18/11/2021	8.384	7.762	0.463	
MW217	13/01/2022	8.455	7.833	0.392	Cloudy no odour
MW217	17/03/2022	8.35	7.728	0.497	
MW217	8/06/2022	8.93	8.308	-0.083	
MW217	8/09/2022	8.255	7.633	0.592	
MW217	16/11/2022	8.472	7.85	0.375	
MW217	15/03/2023	8.47	7.848	0.377	
MW220	2/08/2017	6.49			
MW220	11/09/2017	6.62			
MW220	16/10/2017	6.7			
MW220	17/11/2017	6.715			
MW220	5/12/2017	6.706			NO O/S
MW220	15/01/2018	6.777			NO O/S
MW220	18/12/2019				Dry
MW220	31/03/2020				Bore Dry
MW220	22/07/2020	6.52			Blocked w roots could not sample
MW220	15/12/2020				DRY
MW220	18/03/2021				Dry
MW220	9/06/2021	6.545			Only PFAS Sample collected. not enough water
MW220	31/08/2021				Dry
MW220	16/11/2021				Dry
MW220	18/11/2021	6.658			Blocked with roots
MW220	13/01/2022	6.7			Lots of roots present. Organic smell.
MW220	8/06/2022	6.86			
MW220	8/09/2022	5.13			
MW220	16/11/2022	6.674			
MW224	9/08/2017	12.925	12.269	0.447	
MW224	18/12/2019	13.13	12.474	0.242	
MW224	31/03/2020	13.043	12.387	0.329	
MW224	22/07/2020	12.89	12.234	0.482	
MW224	24/09/2020	13.011	12.355	0.361	
MW224	15/12/2020	13.06	12.404	0.312	
MW224	18/03/2021	12.95	12.294	0.422	Clear
MW224	9/06/2021	12.88	12.224	0.492	
MW224	31/08/2021	12.9	12.244	0.472	
MW224	16/11/2021	12.9	12.244	0.472	
MW224	13/01/2022	12.99	12.334	0.382	
MW224	17/03/2022	12.98	12.324	0.392	
MW224	8/06/2022	13.38	12.724	-0.008	
MW224	8/09/2022	12.25	11.594	1.122	
MW224	15/03/2023	12.975	12.319	0.397	
MW225	2/08/2017	3.94	3.263	0.126	
MW225	11/09/2017	3.85	3.173	0.216	
MW225	19/10/2017	3.92	3.243	0.146	NO ODOUR&SHEEN
MW225	17/11/2017	3.813	3.136	0.253	no o/s
MW225	5/12/2017	3.892	3.215	0.174	NO O/S
MW225	15/01/2018	3.971	3.294	0.095	NO O/S
MW225	10/01/2020				Dry
MW225	31/03/2020				Bore Dry
MW225	22/07/2020				DRY
MW225	24/09/2020				Dry
MW225	15/12/2020				Dry
MW225	17/03/2021				Dry
MW225	9/06/2021				Dry
MW225	1/09/2021	3.85	3.173	0.216	
MW225	16/11/2021				Well blocked by fine sediment/sand. Unblocked and sampled with bailer
MW225	16/03/2022	3.69	3.013	0.376	
MW225	7/06/2022	3.75	3.073	0.316	
MW225	6/09/2022	3.66	2.983	0.406	
MW225	14/03/2023	3.865	3.188	0.201	
MW226	2/08/2017	1.75	1.061	-0.001	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW226	11/09/2017	1.69	1.001	0.059	
MW226	19/10/2017	1.755	1.066	-0.006	NO ODOUR&SHEEN
MW226	17/11/2017	1.622	0.933	0.127	no o/s
MW226	5/12/2017	1.742	1.053	0.007	NO ODOUR, SL TANNIN APPEARANCE
MW226	15/01/2018	1.781	1.092	-0.032	NO ODOUR, SL TANNIN APPEARANCE
MW226	14/01/2020	1.9	1.211	-0.151	
MW226	2/04/2020	1.611	0.922	0.138	
MW226	21/07/2020	1.49	0.801	0.259	
MW226	22/09/2020	1.7	1.011	0.049	
MW226	15/12/2020	1.72	1.031	0.029	
MW226	17/03/2021	1.415	0.726	0.334	Clear,Yellow
MW226	10/06/2021	1.1	0.411	0.649	
MW226	31/08/2021	1.716	1.027	0.033	
MW226	16/03/2022	0.895	0.206	0.854	
MW226	7/06/2022	1.75	1.061	-0.001	
MW226	6/09/2022	1.48	0.791	0.269	
MW226	14/03/2023	1.62	0.931	0.129	
MW227	2/08/2017	2.85	2.219	0.111	3.1
MW227	11/09/2017	2.82	2.189	0.141	
MW227	19/10/2017	2.75	2.119	0.211	NO ODOUR&SHEEN
MW227	17/11/2017	2.829	2.198	0.132	no o/s
MW227	5/12/2017	2.844	2.213	0.117	NO ODOUR, SL TANNIN STAINING
MW227	15/01/2018	2.96	2.329	0.001	NO ODOUR, SL TANNIN STAINING
MW227	17/01/2020				Not found
MW227	1/04/2020	2.795	2.164	0.166	
MW227	22/07/2020	2.705	2.074	0.256	
MW227	21/09/2020	2.77	2.139	0.191	
MW227	15/12/2020	2.78	2.149	0.181	
MW227	15/03/2021	2.8	2.169	0.161	Clear,Cloudy
MW227	10/06/2021	2.488	1.857	0.473	
MW227	31/08/2021	2.807	2.176	0.154	
MW227	14/01/2022	2.88	2.249	0.081	
MW227	16/03/2022	2.702	2.071	0.259	
MW227	7/06/2022	2.73	2.099	0.231	
MW227	7/09/2022	2.61	1.979	0.351	
MW227	14/03/2023	2.85	2.219	0.111	
MW228	2/08/2017	2.15	1.51	0.08	
MW228	11/09/2017	2.115	1.475	0.115	
MW228	19/10/2017	2.195	1.555	0.035	NO ODOUR&SHEEN
MW228	17/11/2017	2.129	1.489	0.101	no o/s
MW228	5/12/2017	2.145	1.505	0.085	NO ODOUR, SL TANNIN STAINING
MW228	15/01/2018	2.268	1.628	-0.038	NO ODOUR, SL TANNIN STAINING
MW228	14/01/2020	3.75	3.75	-1.52	
MW228	1/04/2020	2.082	1.442	0.148	
MW228	22/07/2020	1.98	1.34	0.25	
MW228	21/09/2020	3.075	2.435	-0.845	
MW228	15/12/2020	2.065	1.425	0.165	
MW228	15/03/2021	2.08	1.44	0.15	Cloudy,Clear,Brown
MW228	10/06/2021	1.675	1.035	0.555	
MW228	31/08/2021	2.086	1.446	0.144	
MW228	14/01/2022	2.17	1.53	0.06	
MW228	16/03/2022	2	1.36	0.23	
MW228	7/06/2022	1.92	1.28	0.31	
MW228	7/09/2022	1.893	1.253	0.337	
MW228	14/03/2023	2.13	1.49	0.1	
MW233	8/08/2017	2.99	2.425	0.715	
MW233	13/09/2017	3.175	2.61	0.53	
MW233	19/10/2017	3.265	2.7	0.44	
MW233	21/11/2017	3.435	2.87	0.27	black suspsended solids, no o/s
MW233	5/12/2017	3.3	2.735	0.405	SUSPENDED SOLIDS
MW233	19/01/2018	2.78	2.215	0.925	SUSPENDED SOLIDS
MW233	12/11/2019	3.43	2.865	0.275	
MW233	8/01/2020	3.51	2.945	0.195	Tree roots
MW233	30/03/2020	3.38	2.815	0.325	
MW233	15/07/2020	2.9	2.335	0.805	
MW233	21/09/2020	3.045	2.48	0.66	
MW233	15/12/2020	3.36	2.795	0.345	
MW233	15/03/2021	3.18	2.615	0.525	Clear
MW233	9/06/2021	2.923	2.358	0.782	
MW233	30/08/2021	2.794	2.229	0.911	
MW233	8/11/2021	3.19	2.625	0.515	
MW233	10/01/2022	3.33	2.765	0.375	
MW233	17/03/2022	3.31	2.745	0.395	
MW233	3/05/2022	3.215	2.65	0.49	
MW233	8/06/2022	3.09	2.525	0.615	
MW233	6/09/2022	2.64	2.075	1.065	
MW233	15/11/2022	3.253	2.688	0.452	
MW233	13/03/2023	3.355	2.79	0.35	
MW236	8/08/2017	4.05	3.388	0.592	
MW236	13/09/2017	4.105	3.443	0.537	
MW236	19/10/2017	4.145	3.483	0.497	
MW236	21/11/2017	4.14	3.478	0.502	no o/s
MW236	5/12/2017	4.18	3.518	0.462	
MW236	19/01/2018	4.125	3.463	0.517	
MW236	11/10/2019	4.252	3.59	0.39	
MW236	16/01/2020				Dry
MW236	2/04/2020	4.176	3.514	0.466	
MW236	16/07/2020	4	3.338	0.642	
MW236	21/09/2020	4.14	3.478	0.502	
MW236	15/12/2020	4.18	3.518	0.462	
MW236	16/03/2021	4.08	3.418	0.562	Clear
MW236	10/06/2021	4.01	3.348	0.632	
MW236	31/08/2021	3.95	3.288	0.692	
MW236	8/11/2021	4.117	3.455	0.525	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW236	16/11/2021	3.95	3.288	0.692	
MW236	10/01/2022	4.104	3.442	0.538	
MW236	17/03/2022	5.66	5.66	-1.018	
MW236	3/05/2022	4.071	3.409	0.571	
MW236	7/06/2022	3.995	3.333	0.647	
MW236	6/09/2022	3.88	3.218	0.762	
MW236	15/11/2022	4.101	3.439	0.541	
MW236	13/03/2023	5.66	5.66	-1.018	
MW238	4/08/2017	4.273	4.026	0.554	
MW238	13/09/2017	4.27	4.023	0.557	
MW238	19/10/2017	4.37	4.123	0.457	
MW238	21/11/2017	4.44	4.193	0.387	
MW238	5/12/2017	4.46	4.213	0.367	
MW238	19/01/2018	4.39	4.143	0.437	
MW238	21/10/2019	4.49	4.243	0.337	
MW238	14/01/2020	4	3.753	0.827	
MW238	1/04/2020	4.38	4.133	0.447	
MW238	16/07/2020	4.315	4.068	0.512	
MW238	21/09/2020	4.39	4.143	0.437	
MW238	29/09/2020	4.383	4.136	0.444	
MW238	30/09/2020	4.374	4.127	0.453	
MW238	15/12/2020	4.505	4.258	0.322	
MW238	15/02/2021	4.476	4.229	0.351	
MW238	18/03/2021	4.45	4.203	0.377	Clear
MW238	10/06/2021	4.29	4.043	0.537	
MW238	31/08/2021	3.975	3.728	0.852	
MW238	16/11/2021	3.975	3.728	0.852	
MW238	12/01/2022	4.412	4.165	0.415	Clear no odour
MW238	9/06/2022	4.28	4.033	0.547	
MW238	6/09/2022	3.98	3.733	0.847	
MW238	15/03/2023	4.47	4.223	0.357	
MW239	4/08/2017	3.485	3.395	0.545	sampled at 4.49
MW239	18/10/2019	3.695	3.605	0.335	
MW239	14/01/2020				Dry
MW239	1/04/2020				Bore dry
MW239	22/07/2020	3.505	3.415	0.525	Bore is damaged/bent.
MW239	21/09/2020	3.59	3.5	0.44	
MW239	29/09/2020	3.594	3.504	0.436	
MW239	1/10/2020	3.593	3.503	0.437	
MW239	15/12/2020	3.725	3.635	0.305	
MW239	15/02/2021	3.694	3.604	0.336	
MW239	18/03/2021	3.63	3.54	0.4	Clear
MW239	10/06/2021	3.511	3.421	0.519	
MW239	31/08/2021	3.26	3.17	0.77	
MW239	9/11/2021	3.5	3.41	0.53	
MW239	16/11/2021	3.26	3.17	0.77	
MW239	12/01/2022	3.634	3.544	0.396	Clear slight diesel odour
MW239	3/05/2022	3.626	3.536	0.404	PVC only with large sand/construction material stockpiles directly above well.
MW239	9/06/2022	3.5	3.41	0.53	
MW239	6/09/2022	3.2	3.11	0.83	Well buried in sand stockpile
MW239	11/11/2022	2.373	2.283	1.657	Well headworks buried by sand approx (0.3m), bore located behind sign.
MW239	15/03/2023	3.69	3.6	0.34	
MW240	4/08/2017	3.94	3.967	0.543	
MW240	21/10/2019	4.159	4.186	0.324	
MW240	14/01/2020	2.7	2.727	1.783	
MW240	1/04/2020	4.18	4.207	0.303	
MW240	16/07/2020	3.99	4.017	0.493	
MW240	21/09/2020	4.035	4.062	0.448	
MW240	29/09/2020	4.036	4.063	0.447	
MW240	30/09/2020	4.03	4.057	0.453	
MW240	15/12/2020	4.19	4.217	0.293	
MW240	15/02/2021	4.137	4.164	0.346	
MW240	15/02/2021	4.137	4.164	0.346	
MW240	18/03/2021	4.7	4.727	-0.217	Clear
MW240	10/06/2021	3.94	3.967	0.543	
MW240	31/08/2021	3.67	3.697	0.813	
MW240	16/11/2021	3.67	3.697	0.813	
MW240	12/01/2022	4.068	4.095	0.415	
MW240	9/06/2022	3.935	3.962	0.548	
MW240	6/09/2022	3.657	3.684	0.826	
MW240	15/03/2023	4.11	4.137	0.373	
MW242	7/08/2017	3.05	3.091	0.489	
MW242	18/10/2019	3.238	3.279	0.301	
MW242	8/01/2020	3.359	3.4	0.18	
MW242	30/03/2020	3.934	3.975	-0.395	
MW242	16/07/2020	3.025	3.066	0.514	
MW242	21/09/2020	3.125	3.166	0.414	
MW242	1/10/2020	3.105	3.146	0.434	
MW242	15/12/2020	3.265	3.306	0.274	
MW242	16/02/2021	3.22	3.261	0.319	
MW242	18/03/2021	3.43	3.471	0.109	Clear
MW242	9/06/2021	3.03	3.071	0.509	
MW242	31/08/2021	2.755	2.796	0.784	
MW242	9/11/2021	3.038	3.079	0.501	
MW242	12/01/2022	3.17	3.211	0.369	
MW242	17/03/2022	3.22	3.261	0.319	
MW242	3/05/2022	3.145	3.186	0.394	
MW242	8/06/2022	3.03	3.071	0.509	
MW242	6/09/2022	2.745	2.786	0.794	
MW242	14/11/2022	3.089	3.13	0.45	
MW242	15/03/2023	3.23	3.271	0.309	
MW243	13/09/2017	3.97	3.988	0.922	
MW243	20/10/2017	4.06	4.078	0.832	
MW243	21/11/2017	4.105	4.123	0.787	no o/s

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW243	5/12/2017	4.125	4.143	0.767	
MW243	19/01/2018	4.035	4.053	0.857	
MW243	24/10/2019	4.621	4.639	0.271	
MW243	14/01/2020	4.63	4.648	0.262	
MW243	1/04/2020	4.6	4.618	0.292	
MW243	16/07/2020	4.39	4.408	0.502	
MW243	21/09/2020	4.47	4.488	0.422	
MW243	29/09/2020	4.454	4.472	0.438	
MW243	30/09/2020	4.455	4.473	0.437	
MW243	15/12/2020	4.57	4.588	0.322	
MW243	15/02/2021	4.57	4.588	0.322	
MW243	15/02/2021	4.57	4.588	0.322	
MW243	18/03/2021	4.5	4.518	0.392	
MW243	10/06/2021	4.366	4.384	0.526	
MW243	31/08/2021	4.135	4.153	0.757	
MW243	9/11/2021	4.399	4.417	0.493	
MW243	16/11/2021	4.135	4.153	0.757	
MW243	12/01/2022	4.499	4.517	0.393	
MW243	3/05/2022	4.477	4.495	0.415	
MW243	9/06/2022	4.24	4.258	0.652	
MW243	6/09/2022	4.12	4.138	0.772	
MW243	14/11/2022	4.428	4.446	0.464	
MW243	15/03/2023	4.55	4.568	0.342	
MW245	4/08/2017	3.28	2.579	1.271	sampled at 4.28
MW245	13/09/2017	3.345	2.644	1.206	
MW245	20/10/2017	3.445	2.744	1.106	
MW245	21/11/2017	3.505	2.804	1.046	slight chemical odour, no sheen
MW245	5/12/2017	3.5	2.799	1.051	
MW245	19/01/2018	3.34	2.639	1.211	
MW245	21/10/2019	4.26	3.559	0.291	
MW245	14/01/2020	4.8	4.099	-0.249	
MW245	1/04/2020	4.28	3.579	0.271	
MW245	16/07/2020	3.985	3.284	0.566	
MW245	21/09/2020	4.12	3.419	0.431	
MW245	29/09/2020	4.084	3.383	0.467	
MW245	30/09/2020	3.11	2.409	1.441	
MW245	15/12/2020	4.235	3.534	0.316	
MW245	15/02/2021	4.226	3.525	0.325	
MW245	15/02/2021	4.226	3.525	0.325	
MW245	18/03/2021	4.17	3.469	0.381	Black, hydrocarbon odour
MW245	10/06/2021	3.98	3.279	0.571	
MW245	31/08/2021	3.79	3.089	0.761	
MW245	9/11/2021	4.062	3.361	0.489	
MW245	16/11/2021	3.79	3.089	0.761	
MW245	12/01/2022	4.18	3.479	0.371	
MW245	3/05/2022	4.156	3.455	0.395	
MW245	9/06/2022	4.042	3.341	0.509	
MW245	6/09/2022	3.715	3.014	0.836	
MW245	14/11/2022	4.08	3.379	0.471	
MW245	15/03/2023	4.23	3.529	0.321	
MW249	7/08/2017	4.788	4.132	0.439	
MW249	13/09/2017	4.81	4.154	0.417	
MW249	20/10/2017	4.91	4.254	0.317	
MW249	21/11/2017	4.98	4.324	0.247	
MW249	5/12/2017	5	4.344	0.227	
MW249	19/01/2018	4.87	4.214	0.357	
MW249	15/11/2019	5.062	4.406	0.165	
MW249	8/01/2020	5.14	4.484	0.087	
MW249	30/03/2020	5.036	4.38	0.191	
MW249	16/07/2020	4.8	4.144	0.427	
MW249	21/09/2020	4.885	4.229	0.342	
MW249	29/09/2020	4.892	4.236	0.335	
MW249	1/10/2020	4.886	4.23	0.341	
MW249	15/12/2020	5.015	4.359	0.212	
MW249	16/02/2021	4.992	4.336	0.235	
MW249	16/02/2021	4.992	4.336	0.235	
MW249	15/03/2021	4.93	4.274	0.297	Black
MW249	9/06/2021	4.973	4.317	0.254	
MW249	31/08/2021	4.57	3.914	0.657	
MW249	12/01/2022	4.95	4.294	0.277	No odour. Clayey orange in colour
MW249	17/03/2022	4.99	4.334	0.237	
MW249	8/06/2022	4.795	4.139	0.432	
MW249	6/09/2022	4.572	3.916	0.655	
MW249	13/03/2023	4.995	4.339	0.232	
MW255	4/08/2017	4.05	3.378	0.559	
MW255	13/09/2017	4.121	3.449	0.488	
MW255	20/10/2017	4.16	3.488	0.449	NO ODOUR&SHEEN
MW255	21/11/2017	4.147	3.475	0.462	
MW255	8/12/2017	4.19	3.518	0.419	
MW255	19/01/2018	4.136	3.464	0.473	
MW255	19/12/2019				Dry
MW255	2/04/2020				BORE DRY
MW255	16/07/2020	4.015	3.343	0.594	
MW255	22/09/2020	4.1	3.428	0.509	
MW255	16/12/2020	4.18	3.508	0.429	
MW255	17/03/2021	4.1	3.428	0.509	
MW255	10/06/2021	4.03	3.358	0.579	
MW255	31/08/2021	3.99	3.318	0.619	
MW255	16/11/2021	3.99	3.318	0.619	Murky
MW255	10/01/2022	4.15	3.478	0.459	Clear no odour
MW255	17/03/2022	4.12	3.448	0.489	
MW255	9/06/2022	4.005	3.333	0.604	
MW255	6/09/2022				SWL below hydrasleeve, not recorded
MW255	13/03/2023	4.16	3.488	0.449	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW256	4/08/2017	3.3	3.295	0.54	
MW256	13/09/2017	3.346	3.341	0.494	
MW256	20/10/2017	3.39	3.385	0.45	NO ODOUR&SHEEN
MW256	21/11/2017	3.378	3.373	0.462	no o/s
MW256	8/12/2017	3.42	3.415	0.42	
MW256	19/01/2018	3.365	3.36	0.475	
MW256	8/01/2020	3.56	3.555	0.28	Root blockage at 3m could not sample
MW256	30/03/2020	3.418	3.413	0.422	
MW256	16/07/2020	3.24	3.235	0.6	
MW256	22/09/2020	3.34	3.335	0.5	
MW256	14/12/2020	3.4	3.395	0.44	
MW256	17/03/2021	3.345	3.34	0.495	
MW256	10/06/2021	3.225	3.22	0.615	
MW256	31/08/2021	3.2	3.195	0.64	
MW256	16/11/2021	3.2	3.195	0.64	
MW256	10/01/2022	3.36	3.355	0.48	
MW256	17/03/2022	3.34	3.335	0.5	
MW256	9/06/2022	3.225	3.22	0.615	
MW256	6/09/2022	3.09	3.085	0.75	
MW256	13/03/2023	3.23	3.225	0.61	
MW257	4/08/2017	3.315		0.491	
MW257	13/09/2017	3.367		0.439	
MW257	20/10/2017	3.4		0.406	NO ODOUR&SHEEN
MW257	21/11/2017	3.382		0.424	no o/s
MW257	8/12/2017	3.433		0.373	NO O/S
MW257	19/01/2018	3.361		0.445	NO O/S
MW257	19/12/2019	3.47		0.336	
MW257	16/07/2020	3.245		0.561	
MW257	22/09/2020	3.37		0.436	
MW257	16/12/2020	3.39		0.416	
MW257	18/03/2021	3.82		-0.014	
MW257	9/06/2021	5.268		-1.462	
MW257	31/08/2021	3.225		0.581	
MW257	16/11/2021	3.225		0.581	
MW257	10/01/2022	3.35		0.456	
MW257	17/03/2022	3.34		0.466	
MW257	9/06/2022	3.235		0.571	
MW257	13/03/2023	3.39		0.416	
MW258	4/08/2017	3.565		0.478	
MW258	13/09/2017	3.621		0.422	
MW258	20/10/2017	3.645		0.398	NO ODOUR&SHEEN
MW258	21/11/2017	3.623		0.42	no o/s
MW258	8/12/2017	3.68		0.363	NO ODOUR, SL TANNIN APPEARANCE
MW258	19/01/2018	3.597		0.446	NO ODOUR, SL TANNIN APPEARANCE
MW258	19/12/2019				Dry
MW258	2/04/2020				BORE DRY
MW258	16/07/2020				DRY
MW258	22/09/2020				DRY
MW258	16/12/2020				Dry
MW258	18/03/2021				Dry. Potentially blocked by tree roots
MW258	10/06/2021				DRY
MW258	31/08/2021				Dry
MW258	16/11/2021				Dry
MW258	10/01/2022				Blocked at 3.69
MW258	8/06/2022	3.68		0.363	Unblocked
MW258	6/09/2022				SWL below hydrasleeve. not recorded.
MW258	13/03/2023	3.57		0.473	
MW259	4/08/2017	3.34		0.46	
MW259	13/09/2017	3.39		0.41	
MW259	20/10/2017	3.41		0.39	NO ODOUR&SHEEN
MW259	21/11/2017	3.391		0.409	no o/s
MW259	8/12/2017	3.449		0.351	NO ODOUR, V SL TANNIN APPEARANCE
MW259	19/01/2018	3.371		0.429	NO ODOUR, V SL TANNIN APPEARANCE
MW259	19/12/2019				Dry
MW259	2/04/2020				OBSTRUCTION IN BORE AT 3.4M - UNABLE TO SAMPLE VIA HAND BAILER
MW259	16/07/2020	3.215		0.585	
MW259	22/09/2020	3.39		0.41	
MW259	16/12/2020	3.34		0.46	
MW259	18/03/2021	3.32		0.48	
MW259	10/06/2021	3.22		0.58	
MW259	31/08/2021	3.65		0.15	
MW259	16/11/2021	3.65		0.15	Roots
MW259	11/01/2022	3.375		0.425	No odour, clear. Lots of roots
MW259	17/03/2022	3.34		0.46	
MW259	9/06/2022	3.24		0.56	
MW259	6/09/2022	3.142		0.658	
MW259	13/03/2023	3.28		0.52	
MW261	4/08/2017	3.6	3.652	0.258	
MW261	25/10/2019	3.73	3.782	0.128	
MW261	19/12/2019	3.6	3.652	0.258	
MW261	30/03/2020	3.609	3.661	0.249	
MW261	21/07/2020	3.55	3.602	0.308	
MW261	22/09/2020	3.63	3.682	0.228	
MW261	29/09/2020	3.556	3.608	0.302	
MW261	6/10/2020	3.751	3.803	0.107	
MW261	16/12/2020	3.6	3.652	0.258	
MW261	18/02/2021	3.579	3.631	0.279	
MW261	22/02/2021	3.687	3.739	0.171	
MW261	18/03/2021	3.36	3.412	0.498	
MW261	9/06/2021	3.459	3.511	0.399	
MW261	31/08/2021	3.5	3.552	0.358	
MW261	8/11/2021	3.604	3.656	0.254	
MW261	16/11/2021	3.5	3.552	0.358	
MW261	11/01/2022	3.6	3.652	0.258	Hydrocarbon odour. Well covered in mulch

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW261	17/03/2022	3.73	3.782	0.128	
MW261	6/05/2022				Well buried possibly destroyed, inaccessible behind fencing
MW261	8/06/2022				Not found. covered in mulch in new vegetated area
MW261	6/09/2022				Lost - unable to retrieve with a metal detector
MW261	8/11/2022				Lost/buried behind fence
MW268	1/08/2017	3.9	3.315	0.156	
MW268	19/09/2017	3.911	3.326	0.145	
MW268	16/10/2017	3.77	3.185	0.286	NO ODOUR&SHEEN
MW268	17/11/2017	3.845	3.26	0.211	
MW268	7/12/2017	4.058	3.473	-0.002	NO ODOUR, SL TANNIN APPEARANCE
MW268	16/01/2018	3.884	3.299	0.172	NO ODOUR, SL TANNIN APPEARANCE
MW268	12/11/2019	4.039	3.454	0.017	
MW268	19/12/2019	3.87	3.285	0.186	
MW268	30/03/2020	3.78	3.195	0.276	
MW268	21/07/2020	3.78	3.195	0.276	
MW268	21/09/2020	3.03	2.445	1.026	
MW268	14/12/2020	2.87	2.285	1.186	
MW268	16/03/2021	3.75	3.165	0.306	
MW268	9/06/2021	3.664	3.079	0.392	
MW268	31/08/2021	3.91	3.325	0.146	
MW268	11/11/2021	3.908	3.323	0.148	
MW268	16/11/2021	3.91	3.325	0.146	
MW268	11/01/2022	3.905	3.32	0.151	
MW268	17/03/2022	3.78	3.195	0.276	
MW268	9/06/2022	3.624	3.039	0.432	
MW268	6/09/2022	3.66	3.075	0.396	
MW268	15/03/2023	3.895	3.31	0.161	
MW269	1/08/2017	3.99	3.389	0.163	
MW269	19/09/2017	4.011	3.41	0.142	
MW269	16/10/2017	3.885	3.284	0.268	
MW269	17/11/2017	3.955	3.354	0.198	
MW269	7/12/2017	4.16	3.559	-0.007	NO ODOUR, V SL TANNIN APPEARANCE
MW269	16/01/2018	3.954	3.353	0.199	NO ODOUR, V SL TANNIN APPEARANCE
MW269	12/11/2019	4.16	3.559	-0.007	
MW269	19/12/2019	4	3.399	0.153	
MW269	30/03/2020	3.97	3.369	0.183	
MW269	21/07/2020	3.85	3.249	0.303	
MW269	21/09/2020	4.075	3.474	0.078	
MW269	21/09/2020	4.075	3.474	0.078	
MW269	14/12/2020	3.98	3.379	0.173	
MW269	16/03/2021	3.84	3.239	0.313	
MW269	9/06/2021	3.738	3.137	0.415	
MW269	31/08/2021	4.02	3.419	0.133	
MW269	11/11/2021	4.02	3.419	0.133	
MW269	16/11/2021	4.02	3.419	0.133	
MW269	11/01/2022	3.985	3.384	0.168	
MW269	17/03/2022	3.89	3.289	0.263	
MW269	9/06/2022	3.657	3.056	0.496	
MW269	6/09/2022	3.75	3.149	0.403	
MW269	15/03/2023	4.01	3.409	0.143	
MW282	11/09/2017	5.345	5.446	0.435	
MW282	16/10/2017	5.4	5.501	0.38	
MW282	17/11/2017	5.41	5.511	0.37	
MW282	5/12/2017	5.422	5.523	0.358	NO O/S
MW282	15/01/2018	5.47	5.571	0.31	NO O/S
MW282	18/12/2019	5.5	5.601	0.28	
MW282	31/03/2020	5.412	5.513	0.368	
MW282	22/07/2020	5.21	5.311	0.57	
MW282	24/09/2020	5.378	5.479	0.402	
MW282	15/12/2020	5.4	5.501	0.38	
MW282	9/06/2021	5.25	5.351	0.53	
MW282	31/08/2021	5.24	5.341	0.54	
MW282	16/11/2021	5.24	5.341	0.54	
MW282	13/01/2022	5.355	5.456	0.425	Very orange slight organic odour
MW282	17/03/2022	5.33	5.431	0.45	
MW282	8/06/2022	5.65	5.751	0.13	
MW282	8/09/2022	5.25	5.351	0.53	
MW282	15/03/2023	5.4	5.501	0.38	
MW288	18/09/2017	3.863	3.295	0.14	
MW288	17/10/2017	3.665	3.097	0.338	
MW288	15/11/2017	3.94	3.372	0.063	no o/s
MW288	7/12/2017	4.005	3.437	-0.002	NO ODOUR, SL TANNIN APPEARANCE
MW288	15/01/2018	3.915	3.347	0.088	
MW288	8/01/2020				Dry
MW288	1/04/2020	3.68	3.112	0.323	
MW288	15/07/2020	3.55	2.982	0.453	
MW288	22/09/2020				Dry
MW288	15/12/2020				Dry
MW288	17/03/2021	3.585	3.017	0.418	
MW288	10/06/2021				Dry
MW288	31/08/2021	3.692	3.124	0.311	
MW288	12/01/2022	3.81	3.242	0.193	
MW288	8/06/2022	3.65	3.082	0.353	
MW288	6/09/2022	3.49	2.922	0.513	
MW288	14/03/2023	3.84	3.272	0.163	
MW289	18/09/2017	4.119	4.228	0.376	
MW289	17/10/2017	4.11	4.219	0.385	
MW289	15/11/2017	4.21	4.319	0.285	no o/s
MW289	7/12/2017	4.195	4.304	0.3	NO O/S
MW289	15/01/2018	4.265	4.374	0.23	NO O/S
MW289	17/01/2020				Not found
MW289	30/03/2020	4.186	4.295	0.309	
MW289	22/07/2020	3.97	4.079	0.525	
MW289	21/09/2020	4.105	4.214	0.39	

Location ID	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW289	15/12/2020	4.28	4.389	0.215	
MW289	16/03/2021	4.1	4.209	0.395	
MW289	9/06/2021	3.94	4.049	0.555	
MW289	30/08/2021	3.853	3.962	0.642	
MW289	17/03/2022	4.08	4.189	0.415	
MW289	8/06/2022	3.964	4.073	0.531	
MW289	5/09/2022	3.8	3.909	0.695	
MW289	14/03/2023	4.2	4.309	0.295	
MW500	5/11/2019	3.512	3.58	0.18	
MW500	15/11/2021	3.312	3.38	0.38	
MW500	10/01/2022	3.38	3.448	0.312	
MW500	14/03/2022	3.233	3.301	0.459	
MW500	7/06/2022	3.243	3.311	0.449	
MW500	5/09/2022	3.25	3.318	0.442	
MW500	13/03/2023	3.33	3.398	0.362	
MW516	30/03/2020	6.179	5.489	0.191	
MW516	21/07/2020	6.03	5.34	0.34	
MW516	21/09/2020	6.12	5.43	0.25	
MW516	30/09/2020	6.097	5.407	0.273	
MW516	7/10/2020	6.223	5.533	0.147	
MW516	16/12/2020	6.155	5.465	0.215	
MW516	16/02/2021	6.16	5.47	0.21	
MW516	17/02/2021	6.154	5.464	0.216	
MW516	18/03/2021	6.29	5.6	0.08	
MW516	9/06/2021	6.002	5.312	0.368	
MW516	31/08/2021	5.175	4.485	1.195	
MW516	16/11/2021	5.175	4.485	1.195	
MW516	12/01/2022	6.139	5.449	0.231	Clear slight fuel odour
MW516	17/03/2022	6.08	5.39	0.29	
MW516	8/06/2022	5.985	5.295	0.385	
MW516	6/09/2022	5.87	5.18	0.5	
MW516	13/03/2023	6.15	5.46	0.22	

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Fire Training Area	MW109	8/03/2017	0089_MW109_S_170803	Normal	199045	0.21	0.42	7.7	0.41	1.1	<0.002	0.077	0.13	0.99	0.11	0.47	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW109	20/09/2017	0089_MW109_D_170920	Normal	176250	0.37	0.58	14	1.0	1.8	<0.002	0.11	0.26	1.3	0.13	*0.61*	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW109	20/09/2017	0089_MW109_S_170920	Normal	176250	0.37	0.63	13	0.96	1.3	<0.002	0.10	0.25	1.5	0.14	*0.58*	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW109	18/10/2017	0089_MW109_D_171018	Normal	178113	0.24	0.47	17	0.88	2.5	<0.02	0.12	0.26	1.6	0.20	*0.73*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW109	18/10/2017	0089_MW109_S_171018	Normal	178113	0.23	0.46	17	0.85	2.4	<0.02	0.12	0.26	1.7	0.20	*0.75*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW109	16/11/2017	0089_MW109_D_171116	Normal	203411	0.22	0.43	15	0.46	1.8	<0.02	0.11	0.23	1.7	0.20	*0.64*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW109	16/11/2017	0089_MW109_S_171116	Normal	203411	0.22	0.41	16	0.40	1.8	<0.02	0.10	0.21	1.6	0.19	*0.61*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW109	6/12/2017	0089_MW109_D_171206	Normal	204243	0.19	0.37	15	0.48	1.5	<0.002	0.084	0.28	1.3	0.14	0.53	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW109	6/12/2017	0089_MW109_S_171206	Normal	204243	0.19	0.38	15	0.40	1.3	<0.002	0.074	0.23	1.3	0.11	0.50	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW109	18/01/2018	0089_MW109_D_180118	Normal	205797	0.21	0.56	15	0.71	2.4	<0.002	0.12	0.19	1.5	0.21	0.54	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW109	18/01/2018	0089_MW109_S_180118	Normal	205797	0.21	0.58	16	0.68	2.4	<0.002	0.12	0.19	1.6	0.21	0.53	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW109	16/12/2019	0089_MW109_191216	Normal	EP1913380	0.29	0.58	10.5	0.91	8.96	<0.02	0.4	0.30	1.63	0.20	0.55	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	30/03/2020	0089_MW109_200330	Normal	EP2003333	0.24	0.38	6.60	0.37	4.75	<0.02	<0.1	0.11	0.98	0.08	0.32	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	15/07/2020	0089_MW109_200715	Normal	EP2007385	0.16	0.41	7.18	0.75	6.89	<0.02	<0.1	0.17	0.99	0.14	0.46	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	15/07/2020	0089_QC105_200715	Field Duplicate	EP2007385	0.18	0.48	8.67	0.94	8.64	<0.02	<0.1	0.18	1.11	0.14	0.52	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	15/07/2020	0089_QC205_200215	nterlab Duplicate	732844	0.12	0.21	5.6	0.30	5.5	<0.01	0.08	0.11	0.75	0.12	0.28	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW109	21/09/2020	0089_MW109_200921	Normal	EP2010093	0.18	0.48	11.7	1.22	9.59	<0.02	0.1	0.24	1.31	0.16	*0.63*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	14/12/2020	0089_MW109_201214	Normal	EP2013984	0.12	0.31	8.32	1.10	10.0	<0.02	0.1	0.22	1.31	0.15	0.48	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	14/12/2020	0089_QC108_201214	Field Duplicate	EP2013984	0.12	0.34	8.68	1.20	10.1	<0.02	0.1	0.23	1.36	0.16	*0.67*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	14/12/2020	0089_QC208_201114	nterlab Duplicate	765054	0.12	0.33	9.0	0.64	11	<0.01	0.14	0.21	1.1	0.16	*0.67*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW109	16/03/2021	0089_MW109_210316	Normal	EP2102833	0.34	0.58	3.64	0.22	3.72	<0.02	<0.1	0.10	0.62	0.06	0.18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	8/06/2021	0089_MW109_210608	Normal	EP2106448	0.43	0.94	15.2	1.99	38.0	<0.02	0.2	0.64	3.70	0.25	*0.94*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	30/08/2021	0089_MW109_210830	Normal	EP2110020	0.13	0.28	3.28	0.18	1.59	<0.02	<0.1	0.09	0.46	0.06	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	14/03/2022	0089_MW109_220314	Normal	EP2202975	0.22	0.68	6.84	0.42	3.42	<0.02	0.1	0.19	1.41	0.12	0.38	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	14/03/2022	0089_QC106_220314	Field Duplicate	EP2202975	0.21	0.37	5.61	0.38	3.04	<0.02	0.1	0.17	1.29	0.12	0.35	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	14/03/2022	0089_QC206_220314	nterlab Duplicate	872911	0.18	0.42	5.5	0.24	3.1	<0.01	0.12	0.12	0.86	0.08	0.30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW109	7/06/2022	0089_MW109_220607	Normal	EP2206880	0.14	0.36	6.15	0.52	4.64	<0.02	<0.1	0.15	0.81	0.09	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	7/06/2022	0089_QC107_220607	Field Duplicate	EP2206880	0.15	0.35	5.70	0.50	4.47	<0.02	<0.1	0.16	0.81	0.08	0.28	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	7/06/2022	0089_QC207_220607	nterlab Duplicate	896805	0.14	0.29	4.0	0.38	2.3	<0.004	0.085	0.12	0.63	0.078	0.22	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
	MW109	5/09/2022	0089_MW109_220905	Normal	EP2211343	0.06	0.14	0.53	<0.02	0.08	<0.02	<0.1	<0.02	0.09	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	5/09/2022	0089_QC117_220905	Field Duplicate	EP2211343	0.06	0.14	0.53	<0.02	0.09	<0.02	<0.1	<0.02	0.08	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW109	5/09/2022	0089_QC217_220905	nterlab Duplicate	920981	0.06	0.09	0.32	0.01	0.07	<0.01	<0.05	<0.01	0.05	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW112	30/10/2010	DS3-MB01	Normal	EP1005976					16.4						*5.18*						
	MW112	22/10/2013	WA0001_D53_MB01	Normal	EP1308039					41.5						*1.84*						
	MW112	26/05/2015	D53_MB01	Normal	EP1510572					38.5						*2.26*						
	MW112	29/09/2015	WA0001_MB01	Normal	EP1514335					7.41						*3.02*						
	MW112	23/02/2016	D53_MB01	Normal	EP1601568					20.7						*2.05*						
	MW112	25/10/2016	D53_MB01	Normal	521581					43						*2.6*						
	MW112	25/10/2016	QC102	Field Duplicate	521581					29						*2.6*						
	MW112	25/10/2016	QC202	nterlab Duplicate	521581					31						*2.2*						
	MW112	8/03/2017	0089_MW112_S_170803	Normal	199045	0.28	0.79	21	1.5	26	<0.002	0.16	0.46	2.3	0.6	*3.1*	0.027	0.003	<0.002	<0.005	<0.01	<0.05
	MW112	20/09/2017	0089_MW112_S_170920	Normal	176250	0.17	0.55	13	1.9	1.6	<0.002	0.11	0.19	1.2	0.32	*1.8*	0.034	0.003	<0.002	<0.005	<0.01	<0.05
	MW112	18/10/2017	0089_MW112_S_171018	Normal	178113	0.17	0.46	19	1.6	38	<0.02	0.12	0.34	1.5	0.44	*2.2*	0.032	<0.02	<0.02	<0.05	<0.1	<0.5
	MW112	16/11/2017	0089_MW112_S_171116	Normal	203411	0.099	0.20	9.9	0.63	27	<0.02	0.10	0.20	1.1	0.44	*1.9*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW112	6/12/2017	0089_MW112_S_171206	Normal	204243	0.12	0.30	11	0.72	28	<0.02	0.13	0.43	1.5	0.47	*2.1*	0.040	<0.02	<0.02	<0.05	<0.1	<0.5
	MW112	18/01/2018	0089_MW112_S_180118	Normal	205797	0.13	0.44	7.7	0.90	38	<0.002	0.21	0.48	2.0	0.72	*1.5*	0.039	<0.002	<0.002	<0.005	<0.01	<0.05
	MW112	8/01/2020	0089_MW112_200108	Normal	EP2000179	0.04	0.10	4.94	0.48	19.6	<0.02	<0.2	0.12	0.56	0.16	0.56	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	30/03/2020	0089_MW112_200330	Normal	EP2003333	0.17	0.34	16.3	1.70	54.7	<0.02	0.2	0.48	2.04	0.51	*2.58*	0.06	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	30/03/2020	0089_QC102_200330	Field Duplicate	EP2003333	0.19	0.35	16.7	1.69	54.3	<0.02	0.2	0.50	2.02	0.54	*2.56*	0.06	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	30/03/2020	0089_QC202_200330	nterlab Duplicate	711144	0.10	0.19	9.2	0.73	28	<0.01	0.13	0.28	0.98	0.38	*1.2*	0.04	<0.01	<0.01	<0.01	<0.01	<0.01
	MW112	15/07/2020	0089_MW112_200715	Normal	EP2007385	0.25	2.12	62.7	10.5	21.2	<0.02	0.2	0.75	4.48	0.63	*7.30*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	21/09/2020	0089_MW112_200921	Normal	EP2010093	0.17	0.95	33.7	5.38	17.5	<0.02	0.1	0.48	2.54	0.43	*4.30*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	14/12/2020	0089_MW112_201214	Normal	EP2013984	0.14	0.53	32.5	3.74	16.6	<0.02	0.2	0.41	2.86	0.54	*3.84*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	16/03/2021	0089_MW112_210316	Normal	EP2102833	0.17	1.52	36.6	5.00	14.4	<0.02	0.2	0.56	3.59	0.64	*4.28*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	16/03/2021	0089_QC112_210316	Field Duplicate	EP2102833	0.13	1.00	23.4	3.07	16.0	<0.02	0.1	0.43	2.43	0.49	*3.39*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	16/03/2021	0089_QC212_210316	nterlab Duplicate	781350	0.11	0.43	21	2.7	20	<0.01	0.17	0.37	2.1	0.44	*2.6*	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
	MW112	8/06/2021	0089_MW112_210608	Normal	EP2106448	0.16	1.01	30.4	4.54	26.8	<0.02	0.2	0.56	2.95	0.53	*3.76*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	30/08/2021	0089_MW112_210830	Normal	EP2110020	0.08	0.31	7.60	1.14	31.7	<0.02	0.1	0.32	1.07	0.37	*0.94*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	10/01/2022	0089_MW112_220110	Normal	EP2200214	0.12	0.53	13.5	0.61	45.0	<0.02	0.2	0.38	2.52	0.92	*0.58*	0.07	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	14/03/2022	0089_MW112_220314	Normal	EP2202975	0.11	0.50	12.2	2.58	44.8	<0.02	0.1	0.29	1.68	0.59	*1.67*	0.08	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	14/03/2022	0089_QC105_220314	Field Duplicate	EP2202975	0.10	0.34	7.98	2.43	39.7	<0.02	0.1	0.29	1.63	0.57	*1.57*	0.07	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	14/03/2022	0089_QC205_220314	nterlab Duplicate	872911	0.09	0.23	9.7	1.2	50	<0.01	0.10	0.24	1.1	0.41	*1.3*	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
	MW112	7/06/2022	0089_MW112_220607	Normal	EP2206880	0.02	0.13	7.64	1.52	73.6	<0.02	<0.1	0.12	0.59	0.23	*0.99*	0.08	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	7/06/2022	0089_QC105_220607	Field Duplicate	EP2206880	0.02	0.15	8.02	1.43	80.8	<0.02	<0.1	0.12	0.60	0.25	*1.00*	0.08	<0.02	<0.02	<0.02	<0.02	<0.05
	MW112	7/06/2022	0089_QC205_220607	nterlab Duplicate	896805	0.027	0.15	3.0	0.73	6.7	<0.004	0.045	0.098	0.68	0.19	*1.1*	0.071	0.006	<0.001	<0.001	<0.001	<0.001
	MW112	5/09/2022	0089_MW112_220905	Normal	EP2211343	0.07	0.21	8.15	0.98	59.5	<0.02	<0.1	0.18	0.73	0.28	*1.40*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Fire Training Area	MW120	8/03/2017	0089_MW120_S_170803	Normal	199045	0.024	0.057	2.2	0.19	2.4	<0.002	0.02	0.031	0.13	0.027	0.14	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW120	20/09/2017	0089_MW120_D_170920	Normal	176250	0.030	0.057	6.6	0.15	0.94	<0.002	0.02	0.01	0.090	0.013	0.32	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW120	20/09/2017	0089_MW120_S_170920	Normal	176250	0.028	0.052	6.3	0.10	0.89	<0.002	0.02	0.01	0.086	0.018	0.31	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW120	18/10/2017	0089_MW120_D_171018	Normal	178113	0.028	0.062	4.9	0.20	2.3	<0.002	0.02	0.026	0.12	0.013	0.25	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW120	18/10/2017	0089_MW120_S_171018	Normal	178113	0.029	0.063	4.5	0.19	2.0	<0.002	0.02	0.025	0.12	0.016	0.24	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW120	16/11/2017	0089_MW120_D_171116	Normal	203411	0.031	0.060	5.9	0.19	1.5	<0.002	0.020	0.022	0.12	0.024	0.37	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW120	16/11/2017	0089_MW120_S_171116	Normal	203411	0.028	0.046	5.9	0.16	1.3	<0.002	0.020	0.021	0.11	0.028	0.37	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW120	6/12/2017	0089_MW120_D_171206	Normal	204243	0.033	0.072	6.8	0.26	1.4	<0.002	0.020	0.020	0.12	0.014	0.41	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW120	6/12/2017	0089_MW120_S_171206	Normal	204243	0.032	0.073	6.1	0.23	1.5	<0.002	0.020	0.021	0.12	0.013	0.33	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW120	18/01/2018	0089_MW120_D_180118	Normal	205797	0.020	0.14	3.5	0.34	2.3	<0.002	0.023	0.024	0.16	0.021	0.20	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW120	18/01/2018	0089_MW120_S_180118	Normal	205797	0.026	0.14	3.6	0.40	2.5	<0.002	0.023	0.024	0.20	0.020	0.20	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW120	16/12/2019	0089_MW120_191216	Normal	EP1913380	0.04	0.09	5.12	0.48	4.86	<0.02	<0.1	0.04	0.20	0.03	0.25	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	30/03/2020	0089_MW120_200330	Normal	EP2003333	0.05	0.10	5.36	0.67	9.29	<0.02	<0.1	0.04	0.28	0.03	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	15/07/2020	0089_MW120_200715	Normal	EP2007385	0.04	0.11	2.47	0.47	4.28	<0.02	<0.1	0.03	0.26	0.02	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	15/07/2020	0089_QC106_200715	Field Duplicate	EP2007385	0.04	0.12	2.44	0.48	5.95	<0.02	<0.1	0.04	0.26	0.02	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	15/07/2020	0089_QC206_200215	nterlab Duplicate	732844	0.03	0.10	1.8	0.29	4.8	<0.01	<0.05	0.03	0.18	0.02	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW120	14/12/2020	0089_MW120_201214	Normal	EP2013984	0.02	0.05	1.66	0.27	3.86	<0.02	<0.1	0.03	0.15	<0.02	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	16/03/2021	0089_MW120_210316	Normal	EP2102833	0.03	0.05	3.33	0.46	3.81	<0.02	<0.1	0.03	0.15	<0.02	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	8/06/2021	0089_MW120_210608	Normal	EP2106448	0.05	0.05	2.25	0.45	3.88	<0.02	<0.1	0.03	0.17	<0.02	0.13	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	30/08/2021	0089_MW120_210830	Normal	EP2110020	0.02	0.08	16.8	2.23	0.23	<0.02	<0.1	<0.02	0.12	<0.02	*1.59*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	10/01/2022	0089_MW120_220110	Normal	EP2200214	<0.02	0.05	12.7	4.29	1.05	<0.02	<0.1	<0.02	0.14	<0.02	*2.19*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	10/01/2022	0089_QC104_220110	Field Duplicate	EP2200214	<0.02	0.06	13.6	3.75	1.04	<0.02	<0.1	<0.02	0.14	<0.02	*2.14*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	10/01/2022	0089_QC204_220110	nterlab Duplicate	854607	0.02	0.04	8.1	2.5	0.99	<0.01	<0.05	0.02	0.08	0.01	*1.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW120	14/03/2022	0089_MW120_220314	Normal	EP2202975	0.02	0.06	6.94	2.40	1.21	<0.02	<0.1	<0.02	0.13	<0.02	*1.59*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	14/03/2022	0089_QC104_220314	Field Duplicate	EP2202975	0.02	0.06	8.05	2.57	1.32	<0.02	<0.1	<0.02	0.13	<0.02	*1.57*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	14/03/2022	0089_QC204_220314	nterlab Duplicate	872911	0.02	0.04	3.2	0.63	3.3	<0.01	<0.05	0.02	0.10	0.01	0.37	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW120	7/06/2022	0089_MW120_220607	Normal	EP2206880	0.02	0.05	3.52	0.74	1.64	<0.02	<0.1	<0.02	0.10	<0.02	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	5/09/2022	0089_MW120_220905	Normal	EP2211343	0.03	0.07	22.2	3.67	0.36	<0.02	<0.1	<0.02	0.11	<0.02	*2.00*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	5/09/2022	0089_QC116_220905	Field Duplicate	EP2211343	0.02	0.08	21.5	3.54	0.33	<0.02	<0.1	<0.02	0.12	<0.02	*2.00*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW120	5/09/2022	0089_QC216_220905	nterlab Duplicate	920981	0.02	0.11	17	2.1	0.28	<0.01	<0.05	0.01	0.07	0.01	*1.4*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	MW121	23/02/2016	D53_MB03A	Normal	EP1601568					9.22						0.36						
	MW121	25/10/2016	D53_MB03A	Normal	521581					1.6						0.04						
	MW121	8/03/2017	0089_MW121_S_170803	Normal	199045	0.014	0.041	1.7	0.08	1.5	<0.002	0.051	0.17	0.21	0.1	0.13	0.002	<0.002	<0.002	<0.005	<0.01	<0.05
	MW121	20/09/2017	0089_MW121_D_170920	Normal	176250	0.010	0.022	0.70	0.023	0.89	<0.002	0.030	0.062	0.13	0.038	0.051	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW121	20/09/2017	0089_MW121_S_170920	Normal	176250	0.01	0.021	0.63	0.024	0.84	<0.002	0.030	0.062	0.13	0.036	0.056	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW121	18/10/2017	0089_MW121_D_171018	Normal	178113	0.007	0.018	0.59	0.037	0.61	<0.002	0.026	0.066	0.13	0.040	0.053	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW121	18/10/2017	0089_MW121_S_171018	Normal	178113	0.007	0.014	0.47	0.030	0.41	<0.002	0.024	0.061	0.13	0.041	0.054	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW121	16/11/2017	0089_MW121_D_171116	Normal	203411	0.004	0.008	0.24	0.029	0.27	<0.002	0.01	0.034	0.083	0.021	0.040	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW121	16/11/2017	0089_MW121_S_171116	Normal	203411	0.003	0.006	0.23	0.029	0.19	<0.002	0.01	0.030	0.080	0.019	0.041	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW121	6/12/2017	0089_MW121_D_171206	Normal	204243	0.005	0.012	0.37	0.039	0.60	<0.002	0.01	0.031	0.068	0.016	0.038	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW121	6/12/2017	0089_MW121_S_171206	Normal	204243	0.004	0.007	0.26	0.040	0.34	<0.002	0.01	0.023	0.060	0.012	0.029	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW121	18/01/2018	0089_MW121_D_180118	Normal	205797	0.020	0.066	1.4	0.096	4.1	<0.002	0.056	0.13	0.22	0.079	0.12	0.006	<0.002	<0.002	<0.005	<0.01	<0.05
	MW121	18/01/2018	0089_MW121_S_180118	Normal	205797	0.017	0.054	1.2	0.093	3.8	<0.002	0.050	0.11	0.19	0.072	0.11	0.006	<0.002	<0.002	<0.005	<0.01	<0.05
	MW121	16/12/2019	0089_MW121_191216	Normal	EP1913380	0.04	0.06	1.72	0.18	4.39	<0.02	0.1	0.21	0.27	0.09	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	30/03/2020	0089_MW121_200330	Normal	EP2003333	0.60	1.17	15.3	1.34	47.5	<0.02	0.1	0.48	2.37	0.24	*0.88*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	15/07/2020	0089_MW121_200715	Normal	EP2007385	0.15	0.45	20.3	1.00	20.1	<0.02	0.1	0.42	1.21	0.26	*0.76*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	21/09/2020	0089_MW121_200921	Normal	EP2010093	0.04	0.07	3.05	0.15	4.04	<0.02	<0.1	0.08	0.28	0.04	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	14/12/2020	0089_MW121_201214	Normal	EP2013992	0.04	0.07	3.25	0.13	4.87	<0.02	<0.1	0.08	0.30	0.05	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	16/03/2021	0089_MW121_210316	Normal	EP2102833	0.64	1.53	17.7	2.35	29.3	<0.02	0.2	0.40	2.16	0.31	*1.18*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	8/06/2021	0089_MW121_210608	Normal	EP2106448	0.09	0.30	10.5	0.39	2.86	<0.02	0.1	0.26	0.99	0.16	0.28	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	30/08/2021	0089_MW121_210830	Normal	EP2110020	0.19	0.48	11.4	1.03	76.5	<0.02	0.1	0.23	1.22	0.27	*1.42*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	10/01/2022	0089_MW121_220110	Normal	EP2200214	<0.02	<0.02	0.11	<0.02	0.22	<0.02	<0.1	<0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	14/03/2022	0089_MW121_220314	Normal	EP2202975	<0.02	<0.02	0.16	0.03	0.33	<0.02	<0.1	<0.02	0.04	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	14/03/2022	0089_QC102_220314	Field Duplicate	EP2202975	<0.02	<0.02	0.16	0.03	0.43	<0.02	<0.1	<0.02	0.05	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	14/03/2022	0089_QC202_220314	nterlab Duplicate	872911	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW121	7/06/2022	0089_MW121_220607	Normal	EP2206880	0.05	0.16	5.30	0.22	0.59	<0.02	<0.1	0.13	0.46	0.08	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	7/06/2022	0089_QC101_220607	Field Duplicate	EP2206880	0.05	0.16	5.40	0.27	0.72	<0.02	<0.1	0.12	0.45	0.08	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW121	7/06/2022	0089_QC201_220607	nterlab Duplicate	896805	0.046	0.11	4.4	0.17	0.45	<0.004	0.047	0.087	0.41	0.070	0.16	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
	MW121	5/09/2022	0089_MW121_220905	Normal	EP2211343	<0.02	<0.02	0.10	<0.02	0.09	<0.02	<0.1	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	MW123	8/03/2017	0089_MW123_S_170803	Normal	199045	0.038	0.029	0.16	0.003	0.37	<0.002	0.01	0.009	0.024	0.003	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW123	20/09/2017	0089_MW123_D_170920	Normal	176250	0.045	0.036	0.23	0.002	0.43	<0.002	0.02	0.01	0.038	0.005	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW123	20/09/2017	0089_MW123_S_170920	Normal	176250	0.046	0.036	0.20	0.002	0.45	<0.002	0.01	0.009	0.034	0.003	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW123	18/10/2017	0089_MW123_D_171018	Normal	178113	0.040	0.039	0.23	0.006	0.56	<0.002	0.01	0.01	0.043	0.005	0.007	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW123	18/10/2017	0089_MW123_S_171018	Normal	178113	0.039	0.035	0.22	0.006	0.39	<0.002	0.01	0.01	0.043	0.005	0.006	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW123	16/11/2017	0089_MW123_D_171116	Normal	203411	0.042	0.039	0.24	0.006	0.36	<0.002	0.020	0.020	0.060	0.006	0.007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW123	16/11/2017	0089_MW123_S_171116	Normal	203411	0.039	0.048	0.23	0.005	0.32	<0.002	0.01	0.020	0.040	0.005	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW123	6/12/2017	0089_MW123_D_171206	Normal	204243	0.038	0.043	0.28	0.010	0.31	<0.002	0.020	0.024	0.062	0.007	0.007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW123	6/12/2017	0089_MW123_S_171206	Normal	204243	0.044	0.056	0.24	0.007	0.26	<0.002	0.020	0.020	0.050	0.004	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW123	18/01/2018	0089_MW123_D_180118	Normal	205797	0.051	0.071	0.33	0.020	0.49	<0.002	0.026	0.020	0.084	0.008	0.012	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW123	18/01/2018	0089_MW123_S_180118	Normal	205797	0.049	0.068	0.29	0.020	0.46	<0.002	0.027	0.020	0.082	0.008	0.012	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW123	16/12/2019	0089_MW123_191216	Normal	EP1913380	0.06	0.11	1.09	<0.02	0.22	<0.02	<0.1	0.12	0.33	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	16/12/2019	0089_QC101_191216	Field Duplicate	EP1913380	0.06	0.10	1.13	<0.02	0.18	<0.02	<0.1	0.11	0.30	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	16/12/2019	0089_QC201_191216	nterlab Duplicate	694635	0.04	0.06	0.78	<0.01	0.10	<0.01	<0.05	0.08	0.19	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW123	18/12/2019	0089_QC201_191218	nterlab Duplicate	695528	<0.01	0.01	0.09	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW123	14/12/2020	0089_MW123_201214	Normal	EP2013992	0.08	0.05	0.17	<0.02	0.04	<0.02	<0.1	0.08	0.30	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	16/03/2021	0089_MW123_210316	Normal	EP2102833	0.11	0.08	0.48	<0.02	0.05	<0.02	<0.1	0.13	0.47	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	16/03/2021	0089_QC108_210316	Field Duplicate	EP2102833	0.11	0.09	0.49	<0.02	0.06	<0.02	<0.1	0.13	0.48	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	16/03/2021	0089_QC208_210316	nterlab Duplicate	781350	0.08	0.08	0.44	<0.01	0.03	<0.01	0.07	0.11	0.38	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW123	8/06/2021	0089_MW123_210608	Normal	EP2106448	0.16	0.13	0.68	<0.02	0.07	<0.02	<0.1	0.14	0.62	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	8/06/2021	0089_QC102_210608	Field Duplicate	EP2106448	0.16	0.14	0.60	<0.02	0.05	<0.02	<0.1	0.13	0.54	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	8/06/2021	0089_QC202_210608	nterlab Duplicate	802464	0.14	0.15	0.60	<0.01	0.04	<0.01	0.08	0.12	0.47	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW123	30/08/2021	0089_MW123_210830	Normal	EP2110020	0.08	0.08	0.24	<0.02	0.03	<0.02	<0.1	0.05	0.25	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	10/01/2022	0089_MW123_220110	Normal	EP2200214	0.14	0.09	0.33	<0.02	0.02	<0.02	<0.1	0.07	0.38	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	10/01/2022	0089_QC101_220110	Field Duplicate	EP2200214	0.14	0.08	0.30	<0.02	0.02	<0.02	<0.1	0.07	0.37	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
	MW123	10/01/2022	0089_QC201_220110	Interlab Duplicate	854607	0.09	0.08	0.18	<0.01	0.02	<0.01	<0.05	0.05	0.19	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW123	14/03/2022	0089_MW123_220314	Normal	EP2202975	0.31	0.22	0.70	<0.02	0.06	<0.02	0.1	0.17	0.84	0.04	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	7/06/2022	0089_MW123_220607	Normal	EP2206880	0.20	0.18	0.57	<0.02	0.05	<0.02	<0.1	0.12	0.46	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	5/09/2022	0089_MW123_220905	Normal	EP2211343	0.10	0.10	0.24	<0.02	0.04	<0.02	<0.1	0.04	0.19	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	5/09/2022	0089_QC114_220905	Field Duplicate	EP2211343	0.13	0.13	0.41	<0.02	0.04	<0.02	<0.1	0.06	0.26	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW123	5/09/2022	0089_QC214_220905	Interlab Duplicate	920981	0.07	0.06	0.19	<0.01	0.02	<0.01	<0.05	0.03	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW124	8/03/2017	0089_MW124_S_170803	Normal	199045	0.003	0.001	0.006	<0.001	0.018	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW124	20/09/2017	0089_MW124_D_170920	Normal	176250	0.005	0.002	0.003	<0.001	0.008	<0.002	0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW124	20/09/2017	0089_MW124_S_170920	Normal	176250	0.005	0.002	0.006	<0.001	0.007	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW124	18/10/2017	0089_MW124_D_171018	Normal	178113	<0.001	0.001	0.004	<0.001	0.012	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW124	18/10/2017	0089_MW124_S_171018	Normal	178113	0.002	<0.001	0.003	<0.001	0.017	<0.002	0.002	<0.002	<0.001	<0.001	0.004	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW124	16/11/2017	0089_MW124_D_171116	Normal	203411	0.004	0.003	0.003	<0.001	0.003	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW124	16/11/2017	0089_MW124_S_171116	Normal	203411	0.004	0.002	0.002	<0.001	0.008	<0.002	0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW124	6/12/2017	0089_MW124_D_171206	Normal	204243	0.004	0.002	0.004	<0.001	0.005	<0.002	0.003	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW124	6/12/2017	0089_MW124_S_171206	Normal	204243	0.003	0.001	0.005	<0.001	0.005	<0.002	0.003	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW124	18/01/2018	0089_MW124_D_180118	Normal	205797	0.002	0.001	0.004	<0.001	0.005	<0.002	0.007	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW124	18/01/2018	0089_MW124_S_180118	Normal	205797	0.003	0.001	0.006	<0.001	0.010	<0.002	0.020	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW124	9/01/2020	0089_MW124_200109	Normal	EP2000249	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	9/01/2020	0089_QC101_200109	Field Duplicate	EP2000249	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	MW124	9/01/2020	0089_QC201_200109	Interlab Duplicate	696324	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW124	30/03/2020	0089_MW124_200330	Normal	EP2003333	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	15/07/2020	0089_MW124_200715	Normal	EP2007382	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	22/09/2020	0089_MW124_200922	Normal	EP2010151	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	14/12/2020	0089_MW124_201214	Normal	EP2013984	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	15/03/2021	0089_MW124_210315	Normal	EP2102752	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	8/06/2021	0089_MW124_210608	Normal	EP2106448	0.12	0.26	1.57	0.03	0.17	<0.02	<0.1	0.07	0.42	0.03	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	30/08/2021	0089_MW124_210830	Normal	EP2110019	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	10/01/2022	0089_MW124_220110	Normal	EP2200216	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	14/03/2022	0089_MW124_220314	Normal	EP2202976	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	7/06/2022	0089_MW124_220607	Normal	EP2206880	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	5/09/2022	0089_MW124_220905	Normal	EP2211345	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	5/09/2022	0089_QC102_220905	Field Duplicate	EP2211345	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW124	5/09/2022	0089_QC202_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW125	8/03/2017	0089_MW125_S_170803	Normal	199045	0.049	0.074	0.24	<0.001	0.011	<0.002	0.008	0.006	0.041	0.002	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	20/09/2017	0089_MW125_D_170920	Normal	176250	0.087	0.12	0.32	<0.001	0.005	<0.002	0.01	<0.002	0.050	0.002	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	20/09/2017	0089_MW125_S_170920	Normal	176250	0.077	0.11	0.30	<0.001	0.011	<0.002	0.01	<0.002	0.046	0.002	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	18/10/2017	0089_MW125_D_171018	Normal	178113	0.042	0.058	0.21	<0.001	0.011	<0.002	0.007	0.005	0.032	0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW125	18/10/2017	0089_MW125_S_171018	Normal	178113	0.033	0.046	0.16	<0.001	0.011	<0.002	0.006	0.004	0.023	0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW125	18/10/2017	0089_QC1MW_171018	Field Duplicate	178113	0.048	0.067	0.20	<0.001	0.006	<0.002	0.008	0.005	0.033	0.001	0.003	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW125	18/10/2017	0089_QC2MW_171018	Interlab Duplicate	568770	0.04	0.05	0.27	<0.01	<0.01	<0.01	<0.05	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW125	16/11/2017	0089_MW125_D_171116	Normal	203411	0.096	0.12	0.32	<0.001	0.001	<0.002	0.01	0.008	0.067	0.003	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	16/11/2017	0089_MW125_S_171116	Normal	203411	0.089	0.11	0.34	<0.001	0.003	<0.002	0.01	0.008	0.063	0.003	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	6/12/2017	0089_MW125_D_171206	Normal	204243	0.062	0.089	0.20	<0.001	0.006	<0.002	0.008	0.006	0.040	0.002	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	6/12/2017	0089_MW125_S_171206	Normal	204243	0.050	0.071	0.20	<0.001	0.007	<0.002	0.008	0.006	0.038	0.002	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	18/01/2018	0089_MW125_D_180118	Normal	205797	0.052	0.080	0.28	<0.001	0.013	<0.002	0.01	0.007	0.053	0.002	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	18/01/2018	0089_MW125_S_180118	Normal	205797	0.040	0.063	0.26	<0.001	0.007	<0.002	0.01	0.007	0.046	0.003	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	18/01/2018	0089_QC1MW_180118	Field Duplicate	205797	0.043	0.062	0.27	<0.001	0.008	<0.002	0.01	0.006	0.040	0.003	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW125	18/01/2018	0089_QC2MW_180118	Interlab Duplicate	581139	0.03	0.05	0.15	<0.01	<0.01	<0.01	<0.05	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	MW125	18/01/2018	0089_QC2MW_180118	Interlab Duplicate	581139	0.03	0.05	0.14	<0.01	<0.01	<0.01	<0.05	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW125	9/01/2020	0089_MW125_200109	Normal	EP2000249	0.10	0.15	0.66	<0.02	<0.01	<0.02	<0.1	<0.02	0.12	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	30/03/2020	0089_MW125_200330	Normal	EP2003333	0.08	0.07	0.40	<0.02	0.04	<0.02	<0.1	<0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	15/07/2020	0089_MW125_200715	Normal	EP2007382	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	22/09/2020	0089_MW125_200922	Normal	EP2010151	0.05	0.06	0.21	<0.02	0.04	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	14/12/2020	0089_MW125_201214	Normal	EP2013984	0.09	0.08	0.38	<0.02	<0.01	<0.02	<0.1	<0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	15/03/2021	0089_MW125_210315	Normal	EP2102752	0.14	0.12	0.43	<0.02	<0.01	<0.02	<0.1	0.02	0.11	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	8/06/2021	0089_MW125_210608	Normal	EP2106448	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	30/08/2021	0089_MW125_210830	Normal	EP2110019	0.06	0.07	0.26	<0.02	0.02	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	30/08/2021	0089_QC101_210830	Field Duplicate	EP2110019	0.06	0.07	0.26	<0.02	0.02	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	30/08/2021	0089_QC201_210830	Interlab Duplicate	820919	0.05	0.05	0.25	<0.01	0.02	<0.01	<0.05	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW125	10/01/2022	0089_MW125_220110	Normal	EP2200216	0.20	0.17	0.63	<0.02	<0.01	<0.02	<0.1	0.02	0.20	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	14/03/2022	0089_MW125_220314	Normal	EP2202976	0.17	0.18	0.72	<0.02	<0.01	<0.02	<0.1	0.03	0.22	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	14/03/2022	0089_QC103_220314	Field Duplicate	EP2202976	0.17	0.19	0.79	<0.02	<0.01	<0.02	<0.1	0.03	0.23	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	14/03/2022	0089_QC203_220314	Interlab Duplicate	872911	0.14	0.14	0.66	<0.01	<0.01	<0.01	<0.05	0.03	0.15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW125	7/06/2022	0089_MW125_220607	Normal	EP2206880	0.18	0.24	0.98	<0.02	<0.01	<0.02	<0.1	0.04	0.25	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW125	5/09/2022	0089_MW125_220905	Normal	EP2211345	0.14	0.12	0.49	<0.02	0.01	<0.02	<0.1	0.03	0.13	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	8/03/2017	0089_MW126_S_170803	Normal	199045	0.001	0.001	0.007	<0.001	0.01	<0.002	0.004	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW126	20/09/2017	0089_MW126_D_170920	Normal	176250	<0.001	<0.001	0.004	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW126	20/09/2017	0089_MW126_S_170920	Normal	176250	<0.001	<0.001	0.002	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW126	18/10/2017	0089_MW126_D_171018	Normal	178113	0.001	<0.001	0.005	<0.001	0.009	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW126	18/10/2017	0089_MW126_S_171018	Normal	178113	0.002	0.002	0.012	<0.001	0.019	<0.002	0.003	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW126	16/11/2017	0089_MW126_D_171116	Normal	203411	<0.001	<0.001	0.002	<0.001	0.009	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW126	16/11/2017	0089_MW126_S_171116	Normal	203411	<0.001	<0.001	0.003	<0.001	0.006	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW126	6/12/2017	0089_MW126_D_171206	Normal	204243	<0.001	<0.001	0.004	<0.001	0.006	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW126	6/12/2017	0089_MW126_S_171206	Normal	204243	0.001	<0.001	0.006	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW126	18/01/2018	0089_MW126_D_180118	Normal	205797	<0.001	<0.001	0.004	<0.001	0.004	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW126	18/01/2018	0089_MW126_S_180118	Normal	205797	<0.001	<0.001	0.007	<0.001	0.006	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
Fire Training Area	MW126	8/01/2020	0089_MW126_200108	Normal	EP2000179	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	31/03/2020	0089_MW126_200331	Normal	EP2003364	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	15/07/2020	0089_MW126_200715	Normal	EP2007382	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	22/09/2020	0089_MW126_200922	Normal	EP2010151	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	14/12/2020	0089_MW126_201214	Normal	EP2013984	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	15/03/2021	0089_MW126_210315	Normal	EP2102752	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	8/06/2021	0089_MW126_210608	Normal	EP2106448	0.11	0.10	0.30	<0.02	0.02	<0.02	<0.1	0.02	0.10	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	30/08/2021	0089_MW126_210830	Normal	EP2110019	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
	MW126	10/01/2022	0089_MW126_220110	Normal	EP2200211	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	14/03/2022	0089_MW126_220314	Normal	EP2202976	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	7/06/2022	0089_MW126_220607	Normal	EP2206880	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW126	5/09/2022	0089_MW126_220905	Normal	EP2211345	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	MW127	8/03/2017	0089_MW127_S_170803	Normal	199045	<0.001	<0.001	0.004	<0.001	0.007	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW127	8/03/2017	0089_QC1MW_S_170803	Field Duplicate	199045	<0.001	<0.001	0.004	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW127	4/08/2017	0089_QC2MW_170803	Interlab Duplicate	557474	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW127	20/09/2017	0089_MW127_S_170920	Normal	176250	<0.001	<0.001	0.003	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW127	18/10/2017	0089_MW127_S_171018	Normal	178113	0.001	<0.001	0.004	<0.001	0.006	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW127	16/11/2017	0089_MW127_S_171116	Normal	203411	<0.001	<0.001	0.003	<0.001	0.004	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW127	16/11/2017	0089_QC1MW_171116	Field Duplicate	203411	<0.001	<0.001	0.002	<0.001	0.004	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW127	16/11/2017	0089_QC2MW_171116	Interlab Duplicate	573296	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW127	6/12/2017	0089_MW127_S_171206	Normal	204243	<0.001	<0.001	0.003	<0.001	0.003	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW127	18/01/2018	0089_MW127_S_180118	Normal	205797	<0.001	<0.001	0.003	<0.001	0.007	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW127	8/01/2020	0089_MW127_200108	Normal	EP2000179	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	31/03/2020	0089_MW127_200331	Normal	EP2003364	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	31/03/2020	0089_QC104_200331	Field Duplicate	EP2003364	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	31/03/2020	0089_QC204_200331	Interlab Duplicate	711434	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW127	15/07/2020	0089_MW127_200715	Normal	EP2007382	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	22/09/2020	0089_MW127_200922	Normal	EP2010151	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	14/12/2020	0089_MW127_201214	Normal	EP2013984	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	15/03/2021	0089_MW127_210315	Normal	EP2102752	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	8/06/2021	0089_MW127_210608	Normal	EP2106448	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	30/08/2021	0089_MW127_210830	Normal	EP2110019	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	10/01/2022	0089_MW127_220110	Normal	EP2200211	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	14/03/2022	0089_MW127_220314	Normal	EP2202976	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	7/06/2022	0089_MW127_220607	Normal	EP2206880	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	5/09/2022	0089_MW127_220905	Normal	EP2211345	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	5/09/2022	0089_QC113_220905	Field Duplicate	EP2211345	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW127	5/09/2022	0089_QC213_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	MW128	8/03/2017	0089_MW128_S_170803	Normal	199045	0.005	0.011	0.82	0.11	1.8	<0.002	0.006	0.005	0.027	0.006	0.14	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	20/09/2017	0089_MW128_D_170920	Normal	176250	0.001	0.001	0.12	0.063	4.0	<0.002	0.004	<0.002	0.013	0.003	0.048	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	20/09/2017	0089_MW128_S_170920	Normal	176250	<0.001	0.002	0.099	0.077	5.0	<0.002	0.005	<0.002	0.013	0.002	0.052	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	20/09/2017	0089_QC1MW_170920	Field Duplicate	176250	0.001	0.002	0.12	0.071	4.5	<0.002	0.005	0.002	0.013	0.003	0.052	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	20/09/2017	0089_QC2MW_170920	Interlab Duplicate	564343	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW128	18/10/2017	0089_MW128_D_171018	Normal	178113	0.001	0.002	0.093	0.080	4.2	<0.002	0.003	0.004	0.011	0.002	0.034	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW128	18/10/2017	0089_MW128_S_171018	Normal	178113	0.001	0.002	0.10	0.084	4.7	<0.002	0.003	0.004	0.011	0.002	0.037	<0.001	<0.002	<0.002	<0.02	<0.05	<0.2
	MW128	16/11/2017	0089_MW128_D_171116	Normal	203411	0.002	0.003	0.080	0.11	4.0	<0.002	<0.004	0.004	0.009	0.002	0.032	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	16/11/2017	0089_MW128_S_171116	Normal	203411	0.002	0.003	0.092	0.11	4.1	<0.002	<0.004	0.004	0.009	0.002	0.032	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	6/12/2017	0089_MW128_D_171206	Normal	204243	0.002	0.005	0.090	0.099	3.2	<0.002	0.003	0.004	0.010	0.002	0.031	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	6/12/2017	0089_MW128_S_171206	Normal	204243	0.002	0.003	0.092	0.091	3.5	<0.002	0.003	0.004	0.010	0.003	0.034	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	6/12/2017	0089_QC1MW_171206	Field Duplicate	204243	0.002	0.003	0.088	0.099	3.4	<0.002	0.003	0.004	0.010	0.003	0.033	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	6/12/2017	0089_QC2MW_171206	Interlab Duplicate	576599	<0.01	<0.01	0.13	0.14	6.2	<0.01	<0.05	<0.01	0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW128	18/01/2018	0089_MW128_D_180118	Normal	205797	0.003	0.007	0.11	0.071	3.8	<0.002	0.003	0.003	0.011	0.002	0.029	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	18/01/2018	0089_MW128_S_180118	Normal	205797	0.003	0.006	0.12	0.10	3.8	<0.002	0.003	0.003	0.011	0.002	0.029	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW128	8/06/2022	0089_MW128_220608	Normal	EP2206971	<0.02	<0.02	0.32	0.05	6.22	<0.02	<0.1	<0.02	0.03	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW128	5/09/2022	0089_MW128_220905	Normal	EP2211343	<0.02	<0.02	0.41	0.09	7.38	<0.02	<0.1	<0.02	0.05	<0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	30/10/2010	C24-MB01	Normal	EP1005976					<0.02						<0.02						
	MW139	18/10/2013	WA0006_C24_MB01	Normal	EP1307981					<0.02						<0.02						
	MW139	26/05/2015	C24_MB01	Normal	EP1510572					0.13						0.16						
	MW139	29/09/2015	C24_MB01	Normal	EP1514335					0.05						<0.02						
	MW139	25/10/2016	C24_MB01	Normal	521581					<0.01						<0.01						
	MW139	1/08/2017	0089_MW139_S_170801	Normal	198918	<0.001	<0.001	0.002	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	19/09/2017	0089_MW139_D_170919	Normal	176140	<0.001	<0.001	0.004	<0.001	0.012	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	19/09/2017	0089_MW139_S_170919	Normal	176140	<0.001	<0.001	0.002	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	17/10/2017	0089_MW139_D_171017	Normal	177985	<0.001	<0.001	0.004	<0.001	0.015	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	17/10/2017	0089_MW139_S_171017	Normal	177985	<0.001	<0.001	0.002	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Demolition Ground	MW139	20/11/2017	0089_MW139_D_171120	Normal	203545	<0.001	<0.001	0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	20/11/2017	0089_MW139_S_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	4/12/2017	0089_MW139_D_171204	Normal	204124	<0.001	<0.001	0.002	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	4/12/2017	0089_MW139_S_171204	Normal	204124	<0.001	<0.001	0.002	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	17/01/2018	0089_MW139_D_1801117	Normal	205691	<0.001	<0.001	0.008	<0.001	0.003	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	17/01/2018	0089_MW139_S_1801117	Normal	205691	<0.001	<0.001	0.009	<0.001	0.004	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	1/02/2018	0089_MW139_D_180201	Normal	206292	<0.001	<0.001	0.005	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	1/02/2018	0089_MW139_I_180201	Normal	206292	<0.001	<0.001	0.004	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	1/02/2018	0089_MW139_S_180201	Normal	206292	<0.001	<0.001	0.006	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	1/02/2018	0089_QC6MW_180201	Field Duplicate	206292	<0.001	<0.001	0.005	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW139	1/02/2018	0089_QC7MW_180201	nterlab Duplicate	582979	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW139	8/01/2020	0089_MW139_200108	Normal	EP2000179	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	8/01/2020	0089_QC101_200108	Field Duplicate	EP2000179	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	8/01/2020	0089_QC201_200108	nterlab Duplicate	696100	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW139	30/03/2020	0089_MW139_200330	Normal	EP2003308	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	20/07/2020	0089_MW139_200720	Normal	EP2007544	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	22/09/2020	0089_MW139_200922	Normal	EP2010151	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	14/12/2020	0089_MW139_201214	Normal	EP2013983	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	16/03/2021	0089_MW139_210316	Normal	EP2102837	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	8/06/2021	0089_MW139_210608	Normal	EP2106464	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	8/06/2021	0089_QC101_210608	Field Duplicate	EP2106464	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	8/06/2021	0089_QC201_210608	nterlab Duplicate	802464	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW139	31/08/2021	0089_MW139_210831	Normal	EP2110071	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	10/01/2022	0089_MW139_220110	Normal	EP2200214	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	15/03/2022	0089_MW139_220315	Normal	EP2203018	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	8/06/2022	0089_MW139_220608	Normal	EP2206969	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW139	5/09/2022	0089_MW139_220905	Normal	EP2211343	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	30/10/2010	C24-MBO3	Normal	EP1005976					12.6						*1.32*						
	MW141	18/10/2013	WA0006_C24_MB03	Normal	EP1307981					62.5						*3.08*						
	MW141	26/05/2015	C24_MB03	Normal	EP1510572					5.62						*0.66*						
	MW141	29/09/2015	C24_MB03	Normal	EP1514335					31.9						*2.16*						
	MW141	25/10/2016	C24_MB03	Normal	521581					31						*0.66*						
	MW141	1/08/2017	0089_MW141_S_170801	Normal	198918	0.74	2.5	24	0.94	58	<0.002	0.53	2.9	27	0.81	*2.3*	0.015	0.006	<0.002	<0.005	<0.01	<0.05
	MW141	19/09/2017	0089_MW141_D_170919	Normal	176140	2.4	5.4	38	2.1	50	<0.002	0.86	1.8	32	0.64	*2.8*	0.030	0.005	<0.002	<0.005	<0.01	<0.05
	MW141	19/09/2017	0089_MW141_S_170919	Normal	176140	2.4	5.4	39	2.1	60	<0.002	0.87	1.8	36	0.63	*2.7*	0.024	0.005	<0.002	<0.005	<0.01	<0.05
	MW141	19/09/2017	0089_QC1MW_170919	Field Duplicate	176140	2.2	5.4	37	2.2	61	<0.002	0.83	1.6	33	0.61	*2.9*	0.027	0.006	<0.002	<0.005	<0.01	<0.05
	MW141	19/09/2017	0089_QC2MW_170919	nterlab Duplicate	564343	1.3	3.1	34	1.5	72	<0.01	0.59	2.7	24	0.83	*2.4*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW141	17/10/2017	0089_MW141_D_171017	Normal	177985	1.5	2.1	20	1.1	37	<0.02	0.45	2.2	18	0.53	*1.4*	0.014	<0.02	<0.02	<0.05	<0.1	<0.5
	MW141	17/10/2017	0089_MW141_S_171017	Normal	177985	2.0	3.4	34	1.4	87	<0.02	0.62	4.3	32	0.86	*2.6*	0.020	<0.02	<0.02	<0.05	<0.1	<0.5
	MW141	20/11/2017	0089_MW141_D_171120	Normal	203545	1.5	3.3	42	1.8	68	<0.1	0.79	4.1	37	1.2	*4.2*	<0.05	<0.1	<0.1	<0.2	<0.5	<2.5
	MW141	20/11/2017	0089_MW141_S_171120	Normal	203545	1.8	3.8	47	1.9	69	<0.1	0.89	5.1	43	1.4	*4.4*	<0.05	<0.1	<0.1	<0.2	<0.5	<2.5
	MW141	4/12/2017	0089_MW141_D_171204	Normal	204124	1.3	2.4	21	0.92	35	<0.04	0.58	1.4	19	0.51	*1.6*	<0.02	<0.04	<0.04	<0.1	<0.2	<1
	MW141	4/12/2017	0089_MW141_S_171204	Normal	204124	1.6	4.2	33	1.3	44	<0.04	0.86	2.7	31	0.77	*2.9*	0.020	<0.04	<0.04	<0.1	<0.2	<1
	MW141	17/01/2018	0089_MW141_D_1801117	Normal	205691	1.7	2.0	26	1.3	28	<0.002	0.82	2.2	27	1.0	*2.6*	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW141	17/01/2018	0089_MW141_S_1801117	Normal	205691	2.5	4.2	54	2.7	93	<0.002	1.6	5.0	65	1.9	*6.2*	0.070	<0.002	<0.002	<0.005	<0.01	<0.05
	MW141	1/02/2018	0089_MW141_D_180201	Normal	206292	1.2	3.7	44	2.6	61	<0.02	0.84	2.4	31	0.86	*3.2*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.05
	MW141	1/02/2018	0089_MW141_I_180201	Normal	206292	1.2	3.6	43	2.8	63	<0.02	0.86	2.4	30	0.94	*3.3*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.05
	MW141	1/02/2018	0089_MW141_S_180201	Normal	206292	1.5	4.8	56	3.8	85	<0.02	1.1	3.4	45	1.3	*4.1*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.05
	MW141	8/01/2020	0089_MW141_200108	Normal	EP2000179	1.25	1.46	19.4	0.72	52.1	<0.02	<0.2	1.36	15.1	0.36	*1.02*	0.05	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	30/03/2020	0089_MW141_200330	Normal	EP2003308	0.54	0.95	14.3	1.18	50.0	<0.02	0.2	0.87	8.49	0.31	*1.19*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	20/07/2020	0089_MW141_200720	Normal	EP2007544	0.48	1.52	16.7	1.28	45.7	<0.02	0.2	1.29	13.1	0.44	*1.71*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	23/09/2020	0089_MW141_200923	Normal	EP2010220	0.70	1.50	18.2	1.88	59.9	<0.02	0.3	1.32	13.6	0.40	*1.71*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	14/12/2020	0089_MW141_201214	Normal	EP2013975	0.59	1.06	10.3	1.01	39.8	<0.02	0.2	1.04	9.09	0.31	*1.10*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	16/03/2021	0089_MW141_210316	Normal	EP2102837	0.43	0.79	8.10	1.06	31.0	<0.02	0.2	0.69	5.86	0.23	*0.78*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	8/06/2021	0089_MW141_210608	Normal	EP2106464	0.38	0.76	10.8	0.79	34.9	<0.02	0.2	0.75	7.77	0.23	*0.91*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	31/08/2021	0089_MW141_210831	Normal	EP2110071	0.63	2.45	26.2	2.44	89.9	<0.02	0.4	1.64	16.1	0.58	*2.47*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	10/01/2022	0089_MW141_220110	Normal	EP2200214	1.18	4.12	53.7	2.68	147	<0.02	0.4	2.12	27.0	0.93	*3.97*	0.06	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	10/01/2022	0089_QC112_220110	Field Duplicate	EP2200214	1.24	2.91	50.0	2.51	127	<0.02	0.5	2.18	27.2	0.92	*3.91*	0.05	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	10/01/2022	0089_QC212_220110	nterlab Duplicate	854607	0.77	2.9	57	2.8	130	<0.01	0.40	1.9	26	0.76	*4.0*	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
	MW141	15/03/2022	0089_MW141_220315	Normal	EP2203018	0.97	2.15	30.8	2.10	81.2	<0.02	0.4	1.58	19.0	0.81	*3.17*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	8/06/2022	0089_MW141_220608	Normal	EP2206969	0.49	1.07	13.3	1.62	40.3	<0.02	0.2	0.67	5.54	0.28	*1.34*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	5/09/2022	0089_MW141_220905	Normal	EP2211343	0.58	1.94	29.2	2.35	102	<0.02	0.3	1.30	13.4	0.54	*2.86*	0.05	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	5/09/2022	0089_QC101_220905	Field Duplicate	EP2211343	0.52	1.75	27.3	2.08	102	<0.02	0.3	1.29	13.0	0.50	*2.68*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
	MW141	5/09/2022	0089_QC201_220905	nterlab Duplicate	920981	0.49	0.96	22	1.2	60	<0.01	0.23	1.1	4.6	0.36	*1.8*	0.03	<0.01	<0.01	<0.01	<0.01	<0.01

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Demolition Ground	MW142	1/08/2017	0089_MW142_S_170801	Normal	198918	0.010	0.028	0.29	0.009	2.3	<0.002	0.009	0.01	0.13	0.005	0.020	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	19/09/2017	0089_MW142_D_170919	Normal	176140	0.034	0.048	0.72	0.008	2.1	<0.002	0.02	0.043	0.45	0.016	0.033	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	19/09/2017	0089_MW142_S_170919	Normal	176140	0.041	0.060	0.79	0.007	2.3	<0.002	0.021	0.048	0.57	0.019	0.029	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	17/10/2017	0089_MW142_D_171017	Normal	177985	0.033	0.062	0.52	0.020	1.6	<0.002	0.01	0.035	0.33	0.01	0.034	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	17/10/2017	0089_MW142_S_171017	Normal	177985	0.032	0.060	0.53	0.013	1.4	<0.002	0.01	0.035	0.40	0.01	0.026	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	17/10/2017	0089_QC1MW_171017	Field Duplicate	177985	0.030	0.060	0.51	0.013	1.2	<0.002	0.01	0.035	0.39	0.01	0.026	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	17/10/2017	0089_QC2MW_171017	nterlab Duplicate	568770	0.03	0.05	0.61	<0.01	2.8	<0.01	<0.05	0.04	0.40	0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW142	20/11/2017	0089_MW142_D_171120	Normal	203545	0.037	0.070	0.60	0.002	1.2	<0.002	0.020	0.050	0.44	0.019	0.028	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	20/11/2017	0089_MW142_S_171120	Normal	203545	0.039	0.087	0.60	0.003	1.1	<0.002	0.020	0.053	0.54	0.026	0.029	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	20/11/2017	0089_QC1MW_171120	Field Duplicate	203545	0.036	0.080	0.60	0.003	1.2	<0.002	0.020	0.053	0.54	0.023	0.030	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	20/11/2017	0089_QC2MW_171120	nterlab Duplicate	573488	0.02	0.08	0.57	0.01	2.4	<0.01	<0.05	0.06	0.47	0.02	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW142	4/12/2017	0089_MW142_D_171204	Normal	204124	0.028	0.053	0.79	0.012	1.7	<0.002	0.023	0.056	0.61	0.020	0.041	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	4/12/2017	0089_MW142_S_171204	Normal	204124	0.042	0.082	1.0	0.016	1.6	<0.002	0.027	0.077	0.94	0.019	0.042	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	4/12/2017	0089_QC1MW_171204	Field Duplicate	204124	0.040	0.086	0.99	0.024	1.5	<0.002	0.01	0.076	1.0	0.019	0.038	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	4/12/2017	0089_QC2MW_171204	nterlab Duplicate	576083	0.03	0.06	1.0	0.01	2.3	<0.01	<0.05	0.10	0.82	0.03	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW142	17/01/2018	0089_MW142_D_1801117	Normal	205691	0.020	0.056	0.80	0.024	1.1	<0.002	0.020	0.047	0.48	0.017	0.043	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	17/01/2018	0089_MW142_S_1801117	Normal	205691	0.033	0.079	1.1	0.024	1.1	<0.002	0.023	0.066	0.74	0.024	0.053	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	1/02/2018	0089_MW142_D_180201	Normal	206292	0.022	0.042	0.66	0.020	1.1	<0.002	0.020	0.046	0.45	0.020	0.044	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	1/02/2018	0089_MW142_I_180201	Normal	206292	0.039	0.082	1.5	0.022	1.2	<0.002	0.030	0.098	1.1	0.036	0.087	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	1/02/2018	0089_MW142_S_180201	Normal	206292	0.11	0.24	4.6	0.037	1.8	<0.002	0.086	0.33	3.9	0.080	0.21	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW142	8/01/2020	0089_MW142_200108	Normal	EP2000179	0.46	1.27	17.0	0.55	7.34	<0.02	<0.2	1.72	15.1	0.35	*0.92*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	30/03/2020	0089_MW142_200330	Normal	EP2003308	0.57	1.33	38.2	0.65	3.59	<0.02	0.4	2.00	21.1	0.63	*3.04*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	20/07/2020	0089_MW142_200720	Normal	EP2007544	<0.02	0.04	1.87	0.08	1.23	<0.02	<0.1	0.04	0.47	0.03	0.21	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	23/09/2020	0089_MW142_200923	Normal	EP2010220	0.03	0.08	3.22	0.13	2.36	<0.02	<0.1	0.08	1.04	0.04	0.25	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	14/12/2020	0089_MW142_201214	Normal	EP2013975	0.05	0.11	3.21	0.11	2.40	<0.02	<0.1	0.11	1.27	0.04	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	16/03/2021	0089_MW142_210316	Normal	EP2102837	0.06	0.13	3.70	0.11	3.13	<0.02	<0.1	0.15	1.49	0.04	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	8/06/2021	0089_MW142_210608	Normal	EP2106464	0.09	0.21	4.21	0.12	2.50	<0.02	<0.1	0.21	2.02	0.06	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	30/08/2021	0089_MW142_210830	Normal	EP2110016	0.06	0.16	3.24	0.11	2.42	<0.02	<0.1	0.15	1.35	0.04	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	10/01/2022	0089_MW142_220110	Normal	EP2200214	0.06	0.10	2.67	0.09	3.33	<0.02	<0.1	0.06	0.91	<0.02	0.14	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	15/03/2022	0089_MW142_220315	Normal	EP2203018	0.04	0.07	1.93	0.08	2.59	<0.02	<0.1	0.12	1.26	0.03	0.18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	8/06/2022	0089_MW142_220608	Normal	EP2206969	0.03	0.07	1.55	0.05	2.32	<0.02	<0.1	0.08	0.67	<0.02	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW142	5/09/2022	0089_MW142_220905	Normal	EP2211343	0.11	0.25	6.64	0.13	2.77	<0.02	0.1	0.29	2.55	0.07	0.41	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Demolition Ground	MW147	30/10/2010	C24-MB02	Normal	EP1005976					<0.02						<0.02						
	MW147	18/10/2013	QC37	Field Duplicate	EP1307981					<0.02						<0.02						
	MW147	18/10/2013	WA0006_C24_MB02	Normal	EP1307981					<0.02						<0.02						
	MW147	26/05/2015	C24_MB02	Normal	EP1510572					<0.1						0.13						
	MW147	29/09/2015	C24_MB02	Normal	EP1514335					<0.1						<0.1						
	MW147	25/10/2016	C24_MB02	Normal	521581					0.04						<0.01						
	MW147	1/08/2017	0089_MW147_S_170801	Normal	198918	0.005	0.013	0.21	<0.001	0.023	<0.002	0.003	<0.002	0.053	0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	19/09/2017	0089_MW147_D_170919	Normal	176140	0.003	0.004	0.093	<0.001	0.006	<0.002	0.003	<0.002	0.022	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	19/09/2017	0089_MW147_S_170919	Normal	176140	0.003	0.005	0.10	<0.001	0.007	<0.002	0.003	<0.002	0.023	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	17/10/2017	0089_MW147_D_171017	Normal	177985	0.003	0.007	0.13	<0.001	0.009	<0.002	<0.002	<0.002	0.018	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	17/10/2017	0089_MW147_S_171017	Normal	177985	0.003	0.008	0.16	<0.001	0.012	<0.002	<0.002	<0.002	0.019	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	20/11/2017	0089_MW147_D_171120	Normal	203545	0.003	0.005	0.14	<0.001	0.018	<0.002	<0.002	<0.002	0.018	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	20/11/2017	0089_MW147_S_171120	Normal	203545	0.003	0.012	0.20	<0.001	0.008	<0.002	<0.002	<0.002	0.017	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	4/12/2017	0089_MW147_D_171204	Normal	204124	0.002	0.004	0.070	<0.001	0.011	<0.002	<0.002	<0.002	0.016	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	4/12/2017	0089_MW147_S_171204	Normal	204124	0.002	0.006	0.13	<0.001	0.010	<0.002	<0.002	<0.002	0.012	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	17/01/2018	0089_MW147_D_1801117	Normal	205691	0.005	0.011	0.21	<0.001	0.003	<0.002	0.003	<0.002	0.019	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	17/01/2018	0089_MW147_S_1801117	Normal	205691	0.009	0.027	0.40	<0.001	0.010	<0.002	0.003	<0.002	0.022	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	1/02/2018	0089_MW147_D_180201	Normal	206292	0.006	0.012	0.24	<0.001	0.005	<0.002	0.003	<0.002	0.019	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	1/02/2018	0089_MW147_I_180201	Normal	206292	0.005	0.013	0.19	<0.001	0.006	<0.002	0.003	<0.002	0.018	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	1/02/2018	0089_MW147_S_180201	Normal	206292	0.007	0.020	0.34	<0.001	0.009	<0.002	0.003	<0.002	0.016	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW147	20/07/2020	0089_MW147_200720	Normal	EP2007544	<0.02	<0.02	0.19	<0.02	0.05	<0.02	<0.1	<0.02	0.14	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Demolition Ground	MW149	1/08/2017	0089_MW149_S_170801	Normal	198918	<0.001	0.001	0.006	<0.001	0.006	<0.002	<0.002	<0.002	0.002	0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	19/09/2017	0089_MW149_D_170919	Normal	176140	<0.001	<0.001	0.004	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	19/09/2017	0089_MW149_S_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	0.007	<0.002	<0.002	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	17/10/2017	0089_MW149_D_171017	Normal	177985	<0.001	<0.001	0.003	<0.001	0.005	<0.002	0.003	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	17/10/2017	0089_MW149_S_171017	Normal	177985	0.001	<0.001	0.004	<0.001	0.007	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	20/11/2017	0089_MW149_D_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	20/11/2017	0089_MW149_S_171120	Normal	203545	<0.001	<0.001	0.004	<0.001	0.003	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	4/12/2017	0089_MW149_D_171204	Normal	204124	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	4/12/2017	0089_MW149_S_171204	Normal	204124	<0.001	<0.001	0.002	<0.001	0.003	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	17/01/2018	0089_MW149_D_1801117	Normal	205691	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	17/01/2018	0089_MW149_S_1801117	Normal	205691	0.002	<0.001	0.001	<0.001	0.007	<0.002	0.007	<0.002	0.003	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	17/01/2018	0089_QC1MW_S_1801117	Field Duplicate	205691	0.002	<0.001	0.001	<0.001	0.007	<0.002	0.005	<0.002	0.003	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	17/01/2018	0089_QC2MW_180117	nterlab Duplicate	580891	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW149	17/01/2018	0089_QC2MW_180117	nterlab Duplicate	580891	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW149	1/02/2018	0089_MW149_D_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	1/02/2018	0089_MW149_I_180201	Normal	206292	<0.001	<0.001	0.001	<0.001	0.003	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	1/02/2018	0089_MW149_S_180201	Normal	206292	<0.001	<0.001	0.007	<0.001	0.007	<0.002	0.007	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW149	8/01/2020	0089_MW149_200108	Normal	EP2000179	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	30/03/2020	0089_MW149_200330	Normal	EP2003308	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	20/07/2020	0089_MW149_200720	Normal	EP2007544	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	23/09/2020	0089_MW149_200923	Normal	EP2010217	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	14/12/2020	0089_MW149_201214	Normal	EP2013983	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	16/03/2021	0089_MW149_210316	Normal	EP2102836	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	8/06/2021	0089_MW149_210608	Normal	EP2106464	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	8/06/2021	0089_QC105_210608	Field Duplicate	EP2106464	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	8/06/2021	0089_QC205_210608	nterlab Duplicate	802464	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW149	30/08/2021	0089_MW149_210830	Normal	EP2110016	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	10/01/2022	0089_MW149_220110	Normal	EP2200214	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	15/03/2022	0089_MW149_220315	Normal	EP2203018	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	8/06/2022	0089_MW149_220608	Normal	EP2206969	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW149	5/09/2022	0089_MW149_220905	Normal	EP2211343	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW158	7/08/2017	0089_MW158_S_170807	Normal	199149	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW158	8/01/2020	0089_MW158_200108	Normal	EP2000182	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	31/03/2020	0089_MW158_200331	Normal	EP2003364	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	21/07/2020	0089_MW158_200721	Normal	EP2007594	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	21/09/2020	0089_MW158_200921	Normal	EP2010093	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	14/12/2020	0089_MW158_201214	Normal	EP2013984	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	15/03/2021	0089_MW158_210315	Normal	EP2102752	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	10/06/2021	0089_MW158_210610	Normal	EP2106588	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	30/08/2021	0089_MW158_210830	Normal	EP2110020	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	30/08/2021	0089_QC110_210830	Field Duplicate	EP2110020	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	30/08/2021	0089_QC210_210830	nterlab Duplicate	820919	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW158	15/03/2022	0089_MW158_220315	Normal	EP2203018	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	7/06/2022	0089_MW158_220607	Normal	EP2206883	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW158	5/09/2022	0089_MW158_220905	Normal	EP2211340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW161	7/08/2017	0089_MW161_S_170807	Normal	199149	0.022	0.019	0.28	0.027	6.1	<0.002	0.048	0.033	0.099	0.06	0.035	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW161	18/09/2017	0089_MW161_S_170918	Normal	176030	0.029	0.021	0.40	0.014	5.6	<0.002	0.063	0.092	0.098	0.072	0.030	0.010	<0.002	<0.002	<0.005	<0.01	<0.05
	MW161	19/10/2017	0089_MW161_S_171019	Normal	178275	0.11	0.084	0.70	0.064	8.7	<0.002	0.10	0.20	0.26	0.11	0.054	0.0099	<0.002	<0.002	<0.005	<0.01	<0.05
	MW161	15/11/2017	0089_MW161_S_171115	Normal	203378	0.049	0.040	0.71	0.12	8.6	<0.002	0.092	0.20	0.34	0.17	0.091	0.021	<0.002	<0.002	<0.005	<0.01	<0.05
	MW161	7/12/2017	0089_MW161_S_171207	Normal	204323	0.066	0.042	0.48	0.040	7.0	<0.002	0.12	0.18	0.29	0.13	0.064	0.020	<0.002	<0.002	<0.005	<0.01	<0.05
	MW161	16/01/2018	0089_MW161_S_180116	Normal	205631	0.076	0.063	0.64	0.063	7.2	<0.002	0.20	0.34	0.33	0.12	0.073	0.023	<0.002	<0.002	<0.005	<0.01	<0.05
	MW161	8/01/2020	0089_MW161_200108	Normal	EP2000182	0.04	0.04	0.71	0.14	16.1	<0.02	0.1	0.45	0.37	0.10	0.10	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	1/04/2020	0089_MW161_200401	Normal	EP2003417	0.09	0.12	1.73	0.31	11.5	<0.02	<0.1	0.32	0.36	0.11	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	21/07/2020	0089_MW161_200721	Normal	EP2007594	0.07	0.11	2.53	0.42	10.5	<0.02	0.1	0.36	0.36	0.11	0.23	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	21/09/2020	0089_MW161_200921	Normal	EP2010093	0.06	0.05	1.70	0.22	10.6	<0.02	<0.1	0.32	0.27	0.09	0.17	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	14/12/2020	0089_MW161_201214	Normal	EP2013992	0.03	0.04	1.15	0.14	7.06	<0.02	<0.1	0.17	0.17	0.08	0.11	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	15/03/2021	0089_MW161_210315	Normal	EP2102752	0.05	0.05	0.81	0.11	7.16	<0.02	<0.1	0.21	0.17	0.06	0.08	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	10/06/2021	0089_MW161_210610	Normal	EP2106588	0.05	0.06	0.76	0.10	6.04	<0.02	<0.1	0.27	0.21	0.08	0.09	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	30/08/2021	0089_MW161_210830	Normal	EP2110020	0.04	0.02	0.50	0.08	5.09	<0.02	<0.1	0.20	0.16	0.08	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	10/01/2022	0089_MW161_220110	Normal	EP2200216	0.08	0.08	0.89	0.14	5.45	<0.02	<0.1	0.14	0.34	0.11	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	15/03/2022	0089_MW161_220315	Normal	EP2203018	0.03	0.02	0.35	0.07	4.08	<0.02	<0.1	0.20	0.20	0.10	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	7/06/2022	0089_MW161_220607	Normal	EP2206883	0.05	0.06	0.84	0.11	4.21	<0.02	<0.1	0.15	0.23	0.09	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW161	5/09/2022	0089_MW161_220905	Normal	EP2211340	<0.02	<0.02	0.23	0.03	3.02	<0.02	<0.1	0.08	0.08	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*						
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19						
PFAS NEMP 2020 Recreational Water																	**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																		
Waste Water Treatment Plant	MW166	7/08/2017	0089_MW166_S_170807	Normal	199149		0.037	0.025	0.32	0.056	2	<0.002	0.072	0.073	0.13	0.054	0.067	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW166	18/09/2017	0089_MW166_S_170918	Normal	176030		0.049	0.020	0.44	0.058	2.1	<0.002	0.085	0.16	0.17	0.097	0.074	0.005	<0.002	<0.002	<0.005	<0.01	<0.05
	MW166	19/10/2017	0089_MW166_S_171019	Normal	178275		0.052	0.037	0.32	0.075	1.9	<0.002	0.074	0.17	0.17	0.076	0.087	0.005	<0.002	<0.002	<0.005	<0.01	<0.05
	MW166	15/11/2017	0089_MW166_S_171115	Normal	203378		0.053	0.043	0.41	0.087	1.7	<0.002	0.082	0.20	0.19	0.084	0.070	0.004	<0.002	<0.002	<0.005	<0.01	<0.05
	MW166	7/12/2017	0089_MW166_S_171207	Normal	204323		0.047	0.030	0.37	0.069	1.8	<0.002	0.092	0.17	0.21	0.090	0.064	0.003	<0.002	<0.002	<0.005	<0.01	<0.05
	MW166	16/01/2018	0089_MW166_S_180116	Normal	205631		0.052	0.031	0.54	0.089	2.0	<0.002	0.094	0.18	0.23	0.077	0.056	0.003	<0.002	<0.002	<0.005	<0.01	<0.05
	MW166	8/01/2020	0089_MW166_200108	Normal	EP2000182		0.05	0.04	0.72	0.08	8.95	<0.02	0.1	0.26	0.25	0.09	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	1/04/2020	0089_MW166_200401	Normal	EP2003417		0.08	0.06	1.13	0.32	14.8	<0.02	<0.1	0.30	0.27	0.13	0.12	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	21/07/2020	0089_MW166_200721	Normal	EP2007594		0.07	0.08	1.89	0.49	14.1	<0.02	<0.1	0.29	0.35	0.12	0.16	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	22/09/2020	0089_MW166_200922	Normal	EP2010151		0.04	0.04	0.97	0.19	8.39	<0.02	<0.1	0.31	0.28	0.12	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	14/12/2020	0089_MW166_201214	Normal	EP2013984		0.02	0.02	0.47	0.05	7.53	<0.02	<0.1	0.22	0.20	0.12	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	15/03/2021	0089_MW166_210315	Normal	EP2102752		0.03	0.03	0.74	0.15	8.40	<0.02	<0.1	0.26	0.24	0.12	0.08	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	10/06/2021	0089_MW166_210610	Normal	EP2106588		0.04	0.10	2.27	0.49	8.51	<0.02	0.1	0.34	0.37	0.17	0.16	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	30/08/2021	0089_MW166_210830	Normal	EP2110019		0.03	0.04	0.95	0.22	8.16	<0.02	<0.1	0.29	0.26	0.14	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	10/01/2022	0089_MW166_220110	Normal	EP2200211		<0.02	0.04	0.97	0.16	7.06	<0.02	<0.1	0.29	0.37	0.16	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	15/03/2022	0089_MW166_220315	Normal	EP2203018		0.04	0.06	1.02	0.22	6.79	<0.02	0.1	0.38	0.50	0.20	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	7/06/2022	0089_MW166_220607	Normal	EP2206883		0.02	0.03	0.77	0.20	7.90	<0.02	0.1	0.33	0.30	0.17	0.10	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW166	5/09/2022	0089_MW166_220905	Normal	EP2211340		<0.02	0.02	0.52	0.08	6.18	<0.02	<0.1	0.24	0.23	0.12	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW171	7/08/2017	0089_MW171_S_170807	Normal	199149		1.6	0.87	4.3	0.43	0.17	<0.002	0.7	0.44	2	0.11	0.23	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW171	18/09/2017	0089_MW171_S_170918	Normal	176030		1.7	1.2	4.1	0.22	0.23	<0.002	0.72	0.23	1.7	0.16	0.25	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW171	19/10/2017	0089_MW171_S_171019	Normal	178275		1.5	0.89	3.8	0.21	0.17	<0.002	0.64	0.48	2.0	0.095	0.22	0.002	<0.002	<0.002	<0.005	<0.01	<0.05
	MW171	15/11/2017	0089_MW171_S_171115	Normal	203378		1.5	0.82	5.1	0.36	0.18	<0.002	0.63	0.40	2.1	0.16	0.24	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW171	7/12/2017	0089_MW171_S_171207	Normal	204323		2.1	1.4	3.7	0.23	0.29	<0.002	0.68	0.53	2.6	0.14	0.26	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW171	16/01/2018	0089_MW171_S_180116	Normal	205631		1.7	0.69	4.6	0.40	0.19	<0.002	0.88	0.60	2.5	0.20	0.22	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW171	1/04/2020	0089_MW171_200401	Normal	EP2003417		<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW171	21/07/2020	0089_MW171_200721	Normal	EP2007594		0.03	<0.02	0.10	<0.02	0.45	<0.02	<0.1	0.06	0.06	0.04	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW171	14/12/2020	0089_MW171_201214	Normal	EP2013992		0.04	<0.02	0.06	<0.02	0.02	<0.02	<0.1	0.04	0.04	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW171	15/03/2021	0089_MW171_210315	Normal	EP2102752		0.07	0.03	0.15	<0.02	0.03	<0.02	<0.1	0.04	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW171	10/06/2021	0089_MW171_210610	Normal	EP2106588		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW171	30/08/2021	0089_MW171_210830	Normal	EP2110019		0.14	0.08	0.35	<0.02	<0.01	<0.02	<0.1	0.06	0.19	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW171	10/01/2022	0089_MW171_220110	Normal	EP2200216		0.10	0.04	0.18	<0.02	<0.01	<0.02	<0.1	0.02	0.12	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW171	15/03/2022	0089_MW171_220315	Normal	EP2203018		<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW171	7/06/2022	0089_MW171_220607	Normal	EP2206883		0.09	0.06	0.24	<0.02	0.03	<0.02	<0.1	0.05	0.14	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW171	5/09/2022	0089_MW171_220905	Normal	EP2211340		0.03	<0.02	0.08	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW172	7/08/2017	0089_MW172_S_170807	Normal	199149		<0.001	<0.001	0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW172	8/06/2022	0089_MW172_220608	Normal	EP2206971		1.79	1.32	6.70	1.63	6.47	<0.02	0.6	0.72	3.23	0.28	*0.66*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW172	6/09/2022	0089_MW172_220906	Normal	EP2211400		1.34	1.29	12.2	2.37	17.4	<0.02	0.5	0.61	2.52	0.23	*0.59*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW173	9/08/2017	0089_MW173_S_170809	Normal	199252		0.064	0.030	0.060	<0.001	0.002	<0.002	0.023	0.020	0.043	0.003	0.014	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW173	18/09/2017	0089_MW173_S_170918	Normal	176030		0.051	0.020	0.067	<0.001	0.003	<0.002	0.022	0.02	0.034	0.004	0.017	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW173	19/10/2017	0089_MW173_S_171019	Normal	178275		0.038	0.024	0.052	<0.001	0.002	<0.002	0.01	0.01	0.020	0.002	0.016	<0.001	<0.002	<0.002	<0.01	<0.02	<0.1
	MW173	15/11/2017	0089_MW173_S_171115	Normal	203378		0.048	0.029	0.051	<0.001	<0.001	<0.002	0.020	0.01	0.030	0.002	0.016	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW173	7/12/2017	0089_MW173_S_171207	Normal	204323		0.044	0.021	0.040	<0.001	0.007	<0.002	0.020	0.01	0.023	0.003	0.014	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW173	16/01/2018	0089_MW173_S_180116	Normal	205631		0.020	0.014	0.033	<0.001	0.002	<0.002	0.004	<0.002	0.003	<0.001	0.008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW173	16/01/2020	0089_MW173_200117	Normal	EP2000515		0.43	0.34	1.17	<0.02	0.02	<0.02	0.1	0.13	0.66	0.03	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW173	31/03/2020	0089_MW173_200331	Normal	EP2003364		0.60	0.39	2.78	0.20	0.23	0.76	0.2	0.28	1.22	0.14	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW173	22/07/2020	0089_MW173_200722	Normal	EP2007667		0.78	1.03	7.62	0.91	1.29	<0.02	0.2	0.49	2.18	0.30	*0.62*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW173	16/03/2021	0089_MW173_210316	Normal	EP2102833		0.30	0.32	4.02	0.74	3.97	<0.02	<0.1	0.27	0.69	0.18	*0.63*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW173	16/03/2021	0089_QC114_210316	Field Duplicate	EP2102833		0.27	0.33	4.49	0.76	4.45	<0.02	<0.1	0.27	0.68	0.18	*0.63*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW173	16/03/2021	0089_QC214_210316	nterlab Duplicate	781350		0.22	0.20	5.1	0.41	4.5	<0.01	0.12	0.21	0.50	0.14	0.50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW173	10/06/2021	0089_MW173_210610	Normal	EP2106579		0.29	0.31	6.64	1.21	6.41	<0.02	0.1	0.32	0.80	0.25	*1.10*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW173	15/03/2022	0089_MW173_220315	Normal	EP2203018		0.35	0.28	4.21	0.51	5.42	<0.02	<0.1	0.18	0.88	0.15	0.45	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW173	8/06/2022	0089_MW173_220608	Normal	EP2206969		0.20	0.18	4.53	0.80	8.62	<0.02	<0.1	0.19	0.50	0.09	0.54	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW173	5/09/2022	0089_MW173_220905	Normal	EP2211340		0.21	0.18	3.74	0.59	5.46	<0.02	<0.1	0.14	0.50	0.08	0.35	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW193	8/08/2017	0089_MW193_S_170808	Normal	199212		1.5	1.4	8.8	0.33	3	<0.002	0.33	0.42	3.1	0.26	0.53	0.004	<0.002	<0.002	<0.005	<0.01	<0.05
	MW193	18/09/2017	0089_MW193_S_170918	Normal	176030		1.4	1.7	7.1	0.57	1.8	<0.002	0.34	0.19	2.3	0.28	0.37	0.003	<0.002	<0.002	<0.005	<0.01	<0.05
	MW193	19/10/2017	0089_MW193_S_171019	Normal	178275		1.1	1.2	6.2	0.36	2.3	<0.002	0.22	0.43	2.4	0.19	0.51	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW193	15/11/2017	0089_MW193_S_171115	Normal	203378		1.1	1.0	6.1	0.28	1.5	<0.002	0.20	0.36	2.5	0.23	0.36	0.002	<0.002	<0.002	<0.005	<0.01	<0.05
	MW193	7/12/2017	0089_MW193_S_171207	Normal	204323		1.2	1.4	6.4	0.26	2.0	<0.002	0.26	0.40	3.2	0.28	0.43	0.003	<0.002	<0.002	<0.005	<0.01	<0.05
	MW193	16/01/2018	0089_MW193_S_180116	Normal	205631		1.1	0.83	5.7	0.28	1.1	<0.002	0.31	0.37	2.4	0.23	0.30	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW193	8/01/2020	0089_MW193_200108	Normal	EP2000186		0.84	0.82	8.20	0.35	1.01	<0.02	0.3	0.41	1.95	0.16	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	31/03/2020	0089_MW193_200331	Normal	EP2003374		1.36	1.28	18.1	0.90	3.62	<0.02	0.4	0.62	2.64	0.31	*0.81*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	15/07/2020	0089_MW193_200715	Normal	EP2007385		1.08	1.31	10.6	0.71	2.67	<0.02	0.2	0.48	2.50	0.26	*0.66*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	16/12/2020	0089_MW193_201216	Normal	EP2014087		0.76	0.58	6.87	0.28	1.56	<0.02	0.2	0.27	1.43	0.12	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	16/03/2021	0089_MW193_210316	Normal	EP2102833		1.22	1.29	10.0	0.70	2.08	<0.02	0.3	0.52	2.44	0.24	*0.62*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	10/06/2021	0089_MW193_210610	Normal	EP2106580		0.89	1.06	8.21	0.45	1.90	<0.02	0.2	0.36	2.01	0.17	0.49	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	30/08/2021	0089_MW193_210830	Normal	EP2110020		1.08	1.31	8.93	0.78	4.45	<0.02	0.3	0.43	2.38	0.22	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	30/08/2021	0089_QC113_210830	Field Duplicate	EP2110020		1.07	1.21	8.17	0.80	3.75	<0.02	0.2	0.42	2.36	0.22	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	30/08/2021	0089_QC213_210830	nterlab Duplicate	820919		1.0	0.75	7.6	0.81	5.4	<0.01	0.24	0.45	2.7	0.23	*0.64*	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01
	MW193	10/01/2022	0089_MW193_220110	Normal	EP2200211		0.55	0.45	5.67	0.25	0.93	<0.02	0.1	0.20	1.28	0.09	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	15/03/2022	0089_MW193_220315	Normal	EP2203018		1.11	1.42	11.9	0.52	1.86	<0.02	0.2	0.46	3.19	0.24	*0.74*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	7/06/2022	0089_MW193_220607	Normal	EP2206883		0.61	0.74	8.14	0.52	1.76	<0.02	0.2	0.33	1.50	0.14	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW193	5/09/2022	0089_MW193_220905	Normal	EP2211340		0.55	0.97	9.84	0.65	3.08	<0.02	0.2	0.27	1.60	0.12	0.52	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW195D	8/08/2017	0089_MW195_D_170808	Normal	199212		0.002	0.002	0.021	<0.001	<0.001	<0.002	<0.002	<0.002	0.005	0.001	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195D	8/08/2017	0089_QC1MW_S_170808	Field Duplicate	199212		0.002	0.002	0.019	<0.001	<0.001	<0.002	<0.002	<0.002	0.005	0.001	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195D	8/08/2017	0089_QC2MW_170808	nterlab Duplicate	558019		<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195D	8/01/2020	0089_MW195-D_200108	Normal	EP2000186		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	0.20	0.24	0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	31/03/2020	0089_MW195_D_200331	Normal	EP2003364		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	15/07/2020	0089_MW195_D_200715	Normal	EP2007385		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	21/09/2020	0089_MW195-D_200921	Normal	EP2010093		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	0.08	0.06	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	16/12/2020	0089_MW195D_201216	Normal	EP2014087		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	16/03/2021	0089_MW195D_210316	Normal	EP2102833		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	16/03/2021	0089_QC115_210316	Field Duplicate	EP2102833		0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	0.26	0.18	0.14	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	16/03/2021	0089_QC215_210316	nterlab Duplicate	781350		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.07	0.18	0.13	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195D	8/06/2021	0089_QC212_210609	nterlab Duplicate	802464		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	0.11	0.09	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
	MW195D	9/06/2021	0089_MW195D_210609	Normal	EP2106514	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	0.10	0.08	0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	9/06/2021	0089_QC112_210609	Field Duplicate	EP2106514	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	0.14	0.11	0.07	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	30/08/2021	0089_MW195D_210830	Normal	EP2110020	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	30/08/2021	0089_QC111_210830	Field Duplicate	EP2110020	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	30/08/2021	0089_QC211_210830	nterlab Duplicate	820919	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195D	10/01/2022	0089_MW195D_220110	Normal	EP2200216	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	15/03/2022	0089_MW195D_220315	Normal	EP2203018	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	0.04	0.04	0.04	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	7/06/2022	0089_MW195D_220607	Normal	EP2206883	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	0.08	0.07	0.08	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195D	5/09/2022	0089_MW195D_220905	Normal	EP2211340	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	8/08/2017	0089_MW195_S_170808	Normal	199212	0.007	0.009	0.003	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195S	18/09/2017	0089_MW195_S_170918	Normal	176030	0.006	0.007	0.010	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195S	18/09/2017	0089_QC1MW_170918	Field Duplicate	176030	0.006	0.008	0.004	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195S	18/09/2017	0089_QC2MW_170918	nterlab Duplicate	564343	<0.01	<0.01	0.10	0.09	5.1	<0.01	<0.05	<0.01	0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195S	19/10/2017	0089_MW195_S_171019	Normal	178275	0.007	0.011	0.006	<0.001	0.004	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.01	<0.02	<0.1
	MW195S	19/10/2017	0089_QC1MW_171019	Field Duplicate	178275	0.007	0.011	0.003	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.01	<0.02	<0.1
	MW195S	19/10/2017	0089_QC2MW_171019	nterlab Duplicate	568924	0.04	0.03	0.04	<0.01	0.01	<0.01	<0.05	0.03	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195S	15/11/2017	0089_MW195_S_171115	Normal	203378	0.007	0.011	0.003	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195S	15/11/2017	0089_QC1MW_171115	Field Duplicate	203378	0.007	0.009	0.003	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195S	15/11/2017	0089_QC2MW_171115	nterlab Duplicate	573296	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195S	7/12/2017	0089_MW195_S_171207	Normal	204323	0.010	0.013	0.006	0.002	0.042	<0.002	<0.002	<0.002	<0.001	<0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195S	7/12/2017	0089_QC1MW_171207	Field Duplicate	204323	0.009	0.008	0.004	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195S	7/12/2017	0089_QC2MW_171207	nterlab Duplicate	576599	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195S	16/01/2018	0089_MW195_S_180116	Normal	205631	0.008	0.013	0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195S	16/01/2018	0089_QC1MW_180116	Field Duplicate	205631	0.008	0.016	0.003	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW195S	16/01/2018	0089_QC2MW_180116	nterlab Duplicate	580891	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195S	8/01/2020	0089_MW195-S_200108	Normal	EP2000186	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	8/01/2020	0089_QC102_200108	Field Duplicate	EP2000186	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW195S	8/01/2020	0089_QC202_200108	nterlab Duplicate	696100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195S	31/03/2020	0089_MW195_S_200331	Normal	EP2003364	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	15/07/2020	0089_MW195_S_200715	Normal	EP2007385	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	21/09/2020	0089_MW195-S_200921	Normal	EP2010093	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	21/09/2020	0089_QC108_200921	Field Duplicate	EP2010093	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	21/09/2020	0089_QC208_200921	nterlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195S	16/12/2020	0089_MW195S_201216	Normal	EP2014087	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	16/03/2021	0089_MW195S_210316	Normal	EP2102833	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	9/06/2021	0089_MW195S_210609	Normal	EP2106514	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	30/08/2021	0089_MW195S_210830	Normal	EP2110020	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	10/01/2022	0089_MW195S_220110	Normal	EP2200216	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	10/01/2022	0089_QC106_220110	Field Duplicate	EP2200216	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	10/01/2022	0089_QC206_220110	nterlab Duplicate	854607	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195S	15/03/2022	0089_MW195S_220315	Normal	EP2203018	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	15/03/2022	0089_QC111_220315	Field Duplicate	EP2203018	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	15/03/2022	0089_QC211_220315	nterlab Duplicate	872903	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW195S	7/06/2022	0089_MW195S_220607	Normal	EP2206883	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	7/06/2022	0089_QC111_220607	Field Duplicate	EP2206883	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW195S	7/06/2022	0089_QC211_220607	nterlab Duplicate	896805	<0.002	0.002	0.013	<0.002	0.006	<0.004	<0.008	<0.002	0.002	<0.004	0.012	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
	MW195S	5/09/2022	0089_MW195S_220905	Normal	EP2211340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	8/08/2017	0089_MW196_S_170808	Normal	199212	<0.001	<0.001	0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW196	2/04/2020	0089_MW196_200402	Normal	EP2003472	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	22/07/2020	0089_MW196_200722	Normal	EP2007667	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	24/09/2020	0089_MW196_200924	Normal	EP2010271	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	16/12/2020	0089_MW196_201216	Normal	EP2014087	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	16/12/2020	0089_QC116_201216	Field Duplicate	EP2014087	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	16/12/2020	0089_QC216_201116	nterlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Waste Water Treatment Plant	MW196	10/06/2021	0089_MW196_210610	Normal	EP2106579	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	30/08/2021	0089_MW196_210830	Normal	EP2110019	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	30/08/2021	0089_QC112_210830	Field Duplicate	EP2110019	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	30/08/2021	0089_QC212_210830	nterlab Duplicate	820919	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	MW196	13/01/2022	0089_MW196_220113	Normal	EP2200340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	14/03/2022	0089_MW196_220314	Normal	EP2202975	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	14/03/2022	0089_QC108_220314	Field Duplicate	EP2202975	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW196	14/03/2022	0089_QC208_220314	nterlab Duplicate	872911	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW196	6/09/2022	0089_MW196_220906	Normal	EP2211389	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW197	9/08/2017	0089_MW197_S_170809	Normal	199252	0.002	0.001	0.008	<0.001	0.002	<0.002	0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW197	18/09/2017	0089_MW197_S_170918	Normal	176030	<0.001	<0.001	<0.001	<0.001	0.003	<0.002	0.008	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW197	19/10/2017	0089_MW197_S_171019	Normal	178275	0.001	<0.001	0.002	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW197	15/11/2017	0089_MW197_S_171115	Normal	203378	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW197	7/12/2017	0089_MW197_S_171207	Normal	204323	<0.001	<0.001	0.004	0.003	0.040	<0.002	0.002	<0.002	<0.001	<0.001	0.004	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
Waste Water Treatment Plant	MW197	16/01/2018	0089_MW197_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW197	31/03/2020	0089_MW197_200331	Normal	EP2003374	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW197	15/07/2020	0089_MW197_200715	Normal	EP2007382	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW197	16/03/2021	0089_MW197_210316	Normal	EP2102833	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW197	9/06/2021	0089_MW197_210609	Normal	EP2106514	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW197	1/09/2021	0089_MW197_210901	Normal	EP2110159	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW197	7/06/2022	0089_MW197_220607	Normal	EP2206883	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW197	5/09/2022	0089_MW197_220905	Normal	EP2211340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	8/08/2017	0089_MW199_S_170808	Normal	199212	<0.001	<0.001	0.005	<0.001	0.006	<0.002	<0.002	<0.002	0.004	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW199	18/09/2017	0089_MW199_S_170918	Normal	176030	<0.001	<0.001	0.002	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW199	19/10/2017	0089_MW199_S_171019	Normal	178275	<0.001	<0.001	0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.01	<0.02	<0.1
	MW199	15/11/2017	0089_MW199_S_171115	Normal	203378	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW199	7/12/2017	0089_MW199_S_171207	Normal	204323	<0.001	<0.001	0.004	0.001	0.043	<0.002	0.003	<0.002	0.001	<0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW199	16/01/2018	0089_MW199_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW199	8/01/2020	0089_MW199_200108	Normal	EP2000186	<0.02	<0.02	0.03	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	31/03/2020	0089_MW199_200331	Normal	EP2003364	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Waste Water Treatment Plant	MW199	15/07/2020	0089_MW199_200715	Normal	EP2007385	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	21/09/2020	0089_MW199_200921	Normal	EP2010093	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	16/12/2020	0089_MW199_201216	Normal	EP2014087	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	30/08/2021	0089_MW199_210830	Normal	EP2110019	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	10/01/2022	0089_MW199_220110	Normal	EP2200216	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	17/03/2022	0089_MW199_220317	Normal	EP2203138	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	7/06/2022	0089_MW199_220607	Normal	EP2206883	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	7/06/2022	0089_QC109_220607	Field Duplicate	EP2206883	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	7/06/2022	0089_QC209_220607	Interlab Duplicate	896805	<0.002	<0.002	<0.002	<0.002	0.005	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
	MW199	5/09/2022	0089_MW199_220905	Normal	EP2211340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	5/09/2022	0089_QC111_220905	Field Duplicate	EP2211340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW199	5/09/2022	0089_QC211_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Waste Water Treatment Plant	MW200	9/08/2017	0089_MW200_S_170809	Normal	199252	0.001	<0.001	0.004	<0.001	0.002	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW200	18/09/2017	0089_MW200_S_170918	Normal	176030	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW200	19/10/2017	0089_MW200_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.01	<0.02	<0.1
	MW200	15/11/2017	0089_MW200_S_171115	Normal	203378	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW200	7/12/2017	0089_MW200_S_171207	Normal	204323	<0.001	<0.001	0.002	0.002	0.031	<0.002	<0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW200	16/01/2018	0089_MW200_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW200	9/01/2020	0089_MW200_200109	Normal	EP2000249	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	31/03/2020	0089_MW200_200331	Normal	EP2003374	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	15/07/2020	0089_MW200_200715	Normal	EP2007382	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	24/09/2020	0089_MW200_200924	Normal	EP2010273	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	15/12/2020	0089_MW200_201215	Normal	EP2014051	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	15/12/2020	0089_QC115_201215	Field Duplicate	EP2014051	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	15/12/2020	0089_QC215_201115	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW200	16/03/2021	0089_MW200_210316	Normal	EP2102833	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	9/06/2021	0089_MW200_210609	Normal	EP2106514	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	1/09/2021	0089_MW200_210901	Normal	EP2110159	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	10/01/2022	0089_MW200_220110	Normal	EP2200216	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	14/03/2022	0089_MW200_220314	Normal	EP2202976	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	7/06/2022	0089_MW200_220607	Normal	EP2206883	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW200	5/09/2022	0089_MW200_220905	Normal	EP2211340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW202	9/08/2017	0089_MW202_S_170809	Normal	199252	0.022	0.020	0.13	0.007	0.060	<0.002	0.007	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW202	18/09/2017	0089_MW202_S_170918	Normal	176030	0.012	0.011	0.10	0.007	0.047	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW202	19/10/2017	0089_MW202_S_171019	Normal	178275	0.009	0.008	0.078	0.009	0.063	<0.002	<0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.01	<0.02	<0.1
	MW202	15/11/2017	0089_MW202_S_171115	Normal	203378	0.020	0.017	0.080	0.009	0.054	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW202	7/12/2017	0089_MW202_S_171207	Normal	204323	0.011	0.007	0.064	0.009	0.092	<0.002	<0.002	<0.002	<0.001	<0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW202	16/01/2018	0089_MW202_S_180116	Normal	205631	0.009	0.009	0.074	0.013	0.050	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW202	31/03/2020	0089_MW202_200331	Normal	EP2003374	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	31/03/2020	0089_QC103_200331	Field Duplicate	EP2003374	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	31/03/2020	0089_QC203_200331	Interlab Duplicate	711434	<0.01	<0.01	0.03	<0.01	0.03	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW202	22/07/2020	0089_MW202_200722	Normal	EP2007667	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	21/09/2020	0089_MW202_200921	Normal	EP2010077	<0.02	<0.02	0.07	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	21/09/2020	0089_QC112_200921	Field Duplicate	EP2010077	<0.02	<0.02	0.06	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	22/09/2020	0089_QC212_200921	Interlab Duplicate	746269	<0.01	<0.01	0.05	<0.01	0.04	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW202	16/12/2020	0089_MW202_201216	Normal	EP2014087	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	15/03/2021	0089_MW202_210315	Normal	EP2102755	<0.02	<0.02	0.03	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	10/06/2021	0089_MW202_210610	Normal	EP2106588	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	30/08/2021	0089_MW202_210830	Normal	EP2110019	<0.02	<0.02	0.04	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	12/01/2022	0089_MW202_220112	Normal	EP2200288	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	18/03/2022	0089_MW202_220318	Normal	EP2203194	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	8/06/2022	0089_MW202_220608	Normal	EP2206971	<0.02	<0.02	0.04	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW202	5/09/2022	0089_MW202_220905	Normal	EP2211345	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Waste Water Treatment Plant	MW203	9/08/2017	0089_MW203_S_170809	Normal	199252	0.041	0.019	0.024	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW203	8/01/2020	0089_MW203_200108	Normal	EP2000182	0.03	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	31/03/2020	0089_MW203_200331	Normal	EP2003374	0.03	0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	31/03/2020	0089_QC102_200331	Field Duplicate	EP2003374	0.04	0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	31/03/2020	0089_QC202_200331	Interlab Duplicate	711434	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW203	15/07/2020	0089_MW203_200715	Normal	EP2007385	0.04	0.04	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	22/09/2020	0089_MW203_200922	Normal	EP2010141	0.04	0.02	0.03	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	16/12/2020	0089_MW203_201216	Normal	EP2014087	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	16/03/2021	0089_MW203_210316	Normal	EP2102837	<0.02	0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	9/06/2021	0089_MW203_210609	Normal	EP2106514	<0.02	<0.02	0.09	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	30/08/2021	0089_MW203_210830	Normal	EP2110019	<0.02	0.02	0.09	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	10/01/2022	0089_MW203_220110	Normal	EP2200216	0.02	0.02	0.07	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	17/03/2022	0089_MW203_220317	Normal	EP2203138	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	7/06/2022	0089_MW203_220607	Normal	EP2206880	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	7/06/2022	0089_QC115_220607	Field Duplicate	EP2206880	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW203	7/06/2022	0089_QC215_220607	Interlab Duplicate	896805	0.009	0.007	0.026	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	0.036	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
	MW203	6/09/2022	0089_MW203_220906	Normal	EP2211390	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	MW214	2/08/2017	0089_MW214_S_170802	Normal	198991	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW214	1/09/2021	0089_MW214_210901	Normal	EP2110159	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW214	13/01/2022	0089_MW214_220113	Normal	EP2200340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW214	16/03/2022	0089_MW214_220316	Normal	EP2203057	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW214	7/06/2022	0089_MW214_220607	Normal	EP2206888	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW214	6/09/2022	0089_MW214_220906	Normal	EP2211400	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	MW215	2/08/2017	0089_MW215_S_170802	Normal	198991	0.013	0.011	0.003	<0.001	<0.001	<0.002	0.005	<0.002	0.003	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW215	1/09/2021	0089_MW215_210901	Normal	EP2110159	0.03	0.03	0.35	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW215	13/01/2022	0089_MW215_220113	Normal	EP2200340	0.04	0.06	0.47	<0.02	<0.01	<0.02	<0.1	0.04	0.13	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW215	16/03/2022	0089_MW215_220316	Normal	EP2203057	0.16	0.12	0.61	<0.02	<0.01	<0.02	<0.1	0.10	0.42	0.03	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW215	7/06/2022	0089_MW215_220607	Normal	EP2206888	0.14	0.17	0.80	<0.02	<0.01	<0.02	<0.1	0.12	0.42	0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW215	6/09/2022	0089_MW215_220906	Normal	EP2211400	0.09	0.13	0.73	<0.02	<0.01	<0.02	<0.1	0.07	0.24	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	2/08/2017	0089_MW216_S_170802	Normal	198991	0.40	0.76	4.2	0.023	0.058	<0.002	0.20	0.90	1.1	0.34	0.16	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW216	11/09/2017	0089_MW216_S_170911	Normal	175533	0.39	0.69	3.1	0.024	0.040	<0.002	0.23	0.96	1.1	0.28	0.12	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Helicopter Support Facility	MW216	16/10/2017	0089_MW216_S_171016	Normal	177956	0.26	0.46	2.2	0.012	0.028	<0.002	0.22	0.92	1.1	0.20	0.083	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW216	17/11/2017	0089_MW216_S_171117	Normal	203443	0.32	0.50	2.4	0.017	0.020	<0.002	0.21	0.94	1.2	0.23	0.072	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW216	5/12/2017	0089_MW216_S_171205	Normal	204183	0.43	0.76	2.5	0.027	0.024	<0.002	0.23	0.64	1.1	0.21	0.079	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW216	15/01/2018	0089_MW216_S_180115	Normal	205568	0.30	0.60	3.2	0.029	0.036	<0.002	0.21	0.77	1.0	0.26	0.093	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW216	19/12/2019	0089_MW216_191219	Normal	EP1913598	0.31	0.51	3.67	0.07	0.22	<0.02	0.4	1.43	1.13	0.25	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	31/03/2020	0089_MW216_200331	Normal	EP2003366	0.30	0.33	2.38	0.06	0.27	<0.02	0.6	4.14	1.79	0.29	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	22/07/2020	0089_MW216_200722	Normal	EP2007667	0.29	0.48	3.24	0.11	0.37	<0.02	0.5	2.50	1.57	0.25	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	15/12/2020	0089_MW216_201215	Normal	EP2014041	0.36	0.62	4.22	0.11	0.63	<0.02	0.8	4.78	2.88	0.37	0.26	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	15/12/2020	0089_QC113_201215	Field Duplicate	EP2014041	0.34	0.60	3.93	0.11	0.62	<0.02	0.7	4.26	2.67	0.34	0.25	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	15/12/2020	0089_QC213_201115	nterlab Duplicate	765054	0.34	0.48	3.6	0.10	0.59	<0.01	1.0	4.3	2.8	0.35	0.28	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW216	18/03/2021	0089_MW216_210318	Normal	EP2102955	0.34	0.41	3.75	0.11	0.55	<0.02	0.9	2.88	2.07	0.33	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	9/06/2021	0089_MW216_210609	Normal	EP2106514	0.51	0.53	3.50	0.15	1.07	<0.02	0.9	3.57	1.85	0.38	0.39	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	31/08/2021	0089_MW216_210831	Normal	EP2110071	0.39	0.50	3.45	0.16	1.04	<0.02	1.0	3.61	1.98	0.32	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	13/01/2022	0089_MW216_220113	Normal	EP2200340	0.62	0.56	4.98	0.18	1.20	<0.02	1.1	4.08	3.08	0.48	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	16/03/2022	0089_MW216_220316	Normal	EP2203057	0.53	0.69	3.65	0.15	0.86	<0.02	0.9	3.66	3.16	0.45	0.41	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	7/06/2022	0089_MW216_220607	Normal	EP2206888	0.39	0.45	3.29	0.16	1.16	<0.02	0.9	3.60	2.23	0.30	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW216	5/09/2022	0089_MW216_220905	Normal	EP2211340	0.32	0.47	3.21	0.11	0.98	<0.02	2.3	9.12	6.45	0.31	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	MW217	2/08/2017	0089_MW217_S_170802	Normal	198991	0.011	0.017	<0.001	<0.001	0.16	<0.002	5.4	31	13	0.82	0.33	0.005	<0.002	<0.002	<0.005	<0.01	<0.05
	MW217	11/09/2017	0089_MW217_S_170911	Normal	175533	0.11	0.12	0.097	<0.001	0.18	<0.002	3.3	5.9	6.8	0.79	0.24	0.016	<0.002	<0.002	<0.005	<0.01	<0.05
	MW217	11/09/2017	0089_QC1MW_170911	Field Duplicate	175533	0.097	0.10	0.10	<0.001	0.17	<0.002	3.5	5.9	6.8	0.70	0.23	0.017	<0.002	<0.002	<0.005	<0.01	<0.05
	MW217	11/09/2017	0089_QC2MW_170911	nterlab Duplicate	562844	0.04	0.02	0.12	<0.01	0.32	<0.01	2.6	11	6.2	1.3	0.27	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
	MW217	16/10/2017	0089_MW217_S_171016	Normal	177956	0.045	0.066	0.24	<0.01	0.16	<0.04	1.7	7.0	5.3	0.84	0.27	<0.01	<0.02	<0.02	<0.1	<0.2	<1
	MW217	17/11/2017	0089_MW217_S_171117	Normal	203443	0.16	0.20	0.19	0.010	0.24	<0.002	1.6	5.8	5.4	1.4	0.26	0.005	<0.002	<0.002	<0.005	<0.01	<0.05
	MW217	5/12/2017	0089_MW217_S_171205	Normal	204183	0.059	0.070	0.044	0.006	0.17	<0.002	2.5	7.8	7.7	0.96	0.20	0.005	<0.002	<0.002	<0.005	<0.01	<0.05
	MW217	15/01/2018	0089_MW217_S_180115	Normal	205568	0.019	0.068	0.012	<0.001	0.11	<0.002	2.9	11	10	1.4	0.27	0.006	<0.002	<0.002	<0.005	<0.01	<0.05
	MW217	19/12/2019	0089_MW217_191219	Normal	EP1913595	<0.02	<0.02	0.02	<0.02	0.13	<0.02	0.2	2.33	2.43	0.68	0.32	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	31/03/2020	0089_MW217_200331	Normal	EP2003366	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.1	0.44	0.51	0.18	0.22	0.07	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	22/07/2020	0089_MW217_200722	Normal	EP2007667	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	0.4	3.29	4.07	0.77	0.29	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	22/07/2020	0089_QC114_200722	Field Duplicate	EP2007667	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	0.4	3.41	4.26	0.82	0.30	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	22/07/2020	0089_QC214_200722	nterlab Duplicate	734409	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	0.48	2.4	2.7	0.60	0.23	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
	MW217	24/09/2020	0089_MW217_200924	Normal	EP2010271	<0.02	<0.02	0.04	<0.02	0.23	<0.02	0.5	3.21	2.66	0.62	0.33	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	15/12/2020	0089_MW217_201215	Normal	EP2014041	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	0.3	2.12	2.44	0.51	0.23	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	18/03/2021	0089_MW217_210318	Normal	EP2102955	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.9	2.56	3.14	0.62	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	9/06/2021	0089_MW217_210609	Normal	EP2106514	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	1.8	6.98	4.33	0.70	0.38	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	31/08/2021	0089_MW217_210831	Normal	EP2110064	0.02	0.02	0.04	<0.02	0.04	<0.02	1.3	6.95	7.76	0.93	0.38	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	13/01/2022	0089_MW217_220113	Normal	EP2200339	0.04	0.02	0.01	<0.02	0.04	<0.02	2.2	10.8	11.7	0.98	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	17/03/2022	0089_MW217_220317	Normal	EP2203138	0.05	0.03	0.02	<0.02	0.09	<0.02	1.7	8.38	13.2	0.92	0.43	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	8/06/2022	0089_MW217_220608	Normal	EP2206971	0.02	0.02	0.02	<0.02	0.06	<0.02	1.5	4.56	5.57	0.88	0.38	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW217	8/09/2022	0089_MW217_220908	Normal	EP2211535	<0.02	0.04	0.05	<0.02	0.05	<0.02	1.0	4.61	4.44	1.23	0.37	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	MW220	26/02/2016	HDF_MB50	Normal	EP1601702					4.4						0.15						
	MW220	4/11/2016	HSF_MB50	Normal	522565					1.5						0.1						
	MW220	2/08/2017	0089_MW220_S_170802	Normal	198991	0.072	0.12	0.65	0.016	0.87	<0.002	0.23	0.40	0.41	0.085	0.041	0.002	<0.002	<0.002	<0.005	<0.01	<0.05
	MW220	11/09/2017	0089_MW220_S_170911	Normal	175533	0.041	0.073	0.35	0.006	0.25	<0.002	0.16	0.25	0.32	0.11	0.021	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW220	16/10/2017	0089_MW220_S_171016	Normal	177956	0.031	0.028	0.19	0.003	0.20	<0.002	0.15	0.15	0.17	0.059	0.014	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW220	17/11/2017	0089_MW220_S_171117	Normal	203443	0.20	0.37	2.0	0.072	0.34	<0.002	0.20	0.34	0.59	0.12	0.10	0.002	<0.002	<0.002	<0.005	<0.01	<0.05
	MW220	5/12/2017	0089_MW220_S_171205	Normal	204183	0.16	0.32	1.8	0.088	0.36	<0.002	0.19	0.24	0.53	0.11	0.12	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW220	5/12/2017	0089_QC1MW_171205	Field Duplicate	204183	0.16	0.31	1.8	0.20	0.39	<0.002	0.19	0.20	0.58	0.12	0.12	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW220	5/12/2017	0089_QC2MW_171205	nterlab Duplicate	576083	0.11	0.19	2.1	0.07	0.46	<0.01	0.18	0.40	0.53	0.14	0.13	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW220	15/01/2018	0089_MW220_S_180115	Normal	205568	0.28	0.77	5.2	0.16	1.2	<0.002	0.26	0.61	1.2	0.30	0.27	0.003	<0.002	<0.002	<0.005	<0.01	<0.05
	MW220	9/06/2021	0089_MW220_210609	Normal	EP2106514	0.18	0.17	3.61	0.46	9.38	<0.02	0.2	0.40	0.55	0.19	*0.60*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW220	13/01/2022	0089_MW220_220113	Normal	EP2200339	0.58	0.27	5.45	0.69	72.0	<0.02	0.4	0.85	1.88	0.28	*0.64*	0.09	<0.02	<0.02	<0.02	<0.02	<0.05
	MW220	8/06/2022	0089_MW220_220608	Normal	EP2206971	0.25	0.18	4.02	0.53	23.5	<0.02	0.2	0.49	0.94	0.19	0.51	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
	MW220	8/09/2022	0089_MW220_220908	Normal	EP2211535	0.26	0.20	4.21	0.55	30.2	<0.02	0.2	0.51	1.08	0.21	0.45	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	MW224	9/08/2017	0089_MW224_S_170809	Normal	199252	0.005	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW224	19/12/2019	0089_MW224_191219	Normal	EP1913595	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.1	<0.02	0.02	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	31/03/2020	0089_MW224_200331	Normal	EP2003366	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	22/07/2020	0089_MW224_200722	Normal	EP2007667	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	24/09/2020	0089_MW224_200924	Normal	EP2010273	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	15/12/2020	0089_MW224_201215	Normal	EP2014041	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	18/03/2021	0089_MW224_210318	Normal	EP2102955	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	9/06/2021	0089_MW224_210609	Normal	EP2106514	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	31/08/2021	0089_MW224_210831	Normal	EP2110064	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	12/01/2022	0089_QC218_220113	nterlab Duplicate	855202	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW224	13/01/2022	0089_MW224_220113	Normal	EP2200339	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	13/01/2022	0089_QC118_220113	Field Duplicate	EP2200339	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	17/03/2022	0089_MW224_220317	Normal	EP2203138	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	8/06/2022	0089_MW224_220608	Normal	EP2206971	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW224	8/09/2022	0089_MW224_220908	Normal	EP2211535	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	MW225	2/08/2017	0089_MW225_S_170802	Normal	198991	<0.001	<0.001	<0.001	<0.001	0.003	<0.002	0.006	0.021	0.011	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW225	11/09/2017	0089_MW225_S_170911	Normal	175533	<0.001	<0.001	0.001	<0.001	0.009	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW225	19/10/2017	0089_MW225_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW225	17/11/2017	0089_MW225_S_171117	Normal	203443	<0.001	<0.001	0.002	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW225	5/12/2017	0089_MW225_S_171205	Normal	204183	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW225	15/01/2018	0089_MW225_S_180115	Normal	205568	<0.001	<0.001	0.001	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW225	1/09/2021	0089_MW225_210901	Normal	EP2110160	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW225	13/01/2022	0089_MW225_220113	Normal	EP2200340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW225	16/03/2022	0089_MW225_220316	Normal	EP2203057	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW225	7/06/2022	0089_MW225_220607	Normal	EP2206888	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW225	7/06/2022	0089_QC112_220607	Field Duplicate	EP2206888	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW225	7/06/2022	0089_QC212_220607	nterlab Duplicate	896805	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
	MW225	6/09/2022	0089_MW225_220906	Normal	EP2211400	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	2/08/2017	0089_MW226_S_170802	Normal	198991	0.012	0.010	0.005	<0.001	0.001	<0.002	0.026	<0.002	0.006	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW226	2/08/2017	0089_QC1MW_170802	Field Duplicate	198991	0.010	0.010	0.004	<0.001	<0.001	<0.002	0.020	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW226	3/08/2017	0089_QC2MW_170802	nterlab Duplicate	557195	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Helicopter Support Facility	MW226	11/09/2017	0089_MW226_S_170911	Normal	175533	0.005	<0.001	0.004	<0.001	<0.001	<0.002	0.003	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW226	19/10/2017	0089_MW226_S_171019	Normal	178275	0.002	<0.001	0.003	<0.001	0.002	<0.002	0.005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW226	17/11/2017	0089_MW226_S_171117	Normal	203443	0.006	0.002	0.003	<0.001	<0.001	<0.002	<0.004	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW226	5/12/2017	0089_MW226_S_171205	Normal	204183	<0.005	<0.005	0.002	<0.001	<0.001	<0.002	0.006	<0.01	<0.005	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW226	15/01/2018	0089_MW226_S_180115	Normal	205568	0.002	0.001	0.002	<0.001	0.001	<0.002	0.020	<0.002	<0.001	0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW226	14/01/2020	0089_MW226_200114	Normal	EP2000432	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	2/04/2020	0089_MW226_200402	Normal	EP2003472	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	2/04/2020	0089_QC101_200402	Field Duplicate	EP2003472	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	2/04/2020	0089_QC201_200402	Interlab Duplicate	712006	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW226	21/07/2020	0089_MW226_200721	Normal	EP2007611	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	22/09/2020	0089_MW226_200922	Normal	EP2010143	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	15/12/2020	0089_MW226_201215	Normal	EP2014042	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	17/03/2021	0089_MW226_210317	Normal	EP2102900	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	10/06/2021	0089_MW226_210610	Normal	EP2106588	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	31/08/2021	0089_MW226_210831	Normal	EP2110071	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	13/01/2022	0089_MW226_220113	Normal	EP2200340	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	16/03/2022	0089_MW226_220316	Normal	EP2203057	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	7/06/2022	0089_MW226_220607	Normal	EP2206888	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW226	6/09/2022	0089_MW226_220906	Normal	EP2211390	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	MW227	2/08/2017	0089_MW227_S_170802	Normal	198991	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	0.009	0.033	0.017	0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW227	11/09/2017	0089_MW227_S_170911	Normal	175533	<0.001	<0.001	0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW227	19/10/2017	0089_MW227_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW227	17/11/2017	0089_MW227_S_171117	Normal	203443	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW227	5/12/2017	0089_MW227_S_171205	Normal	204183	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW227	15/01/2018	0089_MW227_S_180115	Normal	205568	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW227	1/04/2020	0089_MW227_200401	Normal	EP2003417	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	1/04/2020	0089_QC104_200401	Field Duplicate	EP2003417	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	1/04/2020	0089_QC204_200401	Interlab Duplicate	711709	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW227	22/07/2020	0089_MW227_200722	Normal	EP2007648	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	21/09/2020	0089_MW227_200921	Normal	EP2010085	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	15/12/2020	0089_MW227_201215	Normal	EP2014051	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	15/03/2021	0089_MW227_210315	Normal	EP2102752	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	10/06/2021	0089_MW227_210610	Normal	EP2106588	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	31/08/2021	0089_MW227_210831	Normal	EP2110071	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	14/01/2022	0089_MW227_220114	Normal	EP2200399	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	16/03/2022	0089_MW227_220316	Normal	EP2203057	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	7/06/2022	0089_MW227_220607	Normal	EP2206888	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW227	7/09/2022	0089_MW227_220907	Normal	EP2211611	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.10	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	MW228	2/08/2017	0089_MW228_S_170802	Normal	198991	0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.01	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW228	11/09/2017	0089_MW228_S_170911	Normal	175533	0.004	<0.001	<0.001	<0.001	0.004	<0.002	0.051	0.02	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW228	19/10/2017	0089_MW228_S_171019	Normal	178275	0.003	<0.001	<0.001	<0.001	<0.001	<0.002	0.077	0.044	0.009	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW228	17/11/2017	0089_MW228_S_171117	Normal	203443	0.004	<0.001	<0.001	<0.001	<0.001	<0.002	0.11	0.041	0.009	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW228	5/12/2017	0089_MW228_S_171205	Normal	204183	0.007	0.001	<0.001	<0.001	<0.001	<0.002	0.20	0.089	0.020	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW228	15/01/2018	0089_MW228_S_180115	Normal	205568	0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.071	0.070	0.010	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW228	15/01/2018	0089_QC1MW_180115	Field Duplicate	205568	0.002	<0.001	<0.001	<0.001	0.003	<0.002	0.080	0.072	0.010	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW228	15/01/2018	0089_QC2MW_180115	Interlab Duplicate	580891	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW228	14/01/2020	0089_MW228_200114	Normal	EP2000432	0.06	<0.02	<0.02	<0.02	<0.01	<0.02	1.1	12.0	11.0	1.42	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	1/04/2020	0089_MW228_200401	Normal	EP2003417	0.11	0.04	0.03	<0.02	<0.01	<0.02	0.6	15.3	13.8	2.33	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	1/04/2020	0089_QC103_200401	Field Duplicate	EP2003417	0.03	<0.02	<0.02	<0.02	<0.01	<0.02	0.3	5.80	4.24	0.75	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	1/04/2020	0089_QC203_200401	Interlab Duplicate	711709	0.05	0.02	<0.01	<0.01	<0.01	<0.01	1.4	8.1	5.9	1.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW228	22/07/2020	0089_MW228_200722	Normal	EP2007648	0.02	<0.02	<0.02	<0.02	<0.01	<0.02	1.1	5.89	4.89	0.40	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	22/07/2020	0089_QC112_200722	Field Duplicate	EP2007648	0.02	<0.02	<0.02	<0.02	<0.01	<0.02	1.2	6.04	5.01	0.44	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	22/07/2020	0089_QC212_200722	Interlab Duplicate	734409	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.79	2.9	2.5	0.19	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW228	21/09/2020	0089_MW228_200921	Normal	EP2010085	0.06	<0.02	<0.02	<0.02	<0.01	<0.02	2.2	11.0	9.44	0.85	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	15/12/2020	0089_MW228_201215	Normal	EP2014047	0.31	0.13	0.11	<0.02	<0.01	<0.02	4.2	14.0	15.0	3.42	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	15/03/2021	0089_MW228_210315	Normal	EP2102752	0.10	0.04	0.03	<0.02	<0.01	<0.02	2.0	9.40	8.86	1.16	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	10/06/2021	0089_MW228_210610	Normal	EP2106588	0.07	<0.02	<0.02	<0.02	<0.01	<0.02	1.1	5.09	4.65	0.70	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	31/08/2021	0089_MW228_210831	Normal	EP2110071	0.22	0.15	0.13	<0.02	<0.01	<0.02	2.3	10.4	10.4	2.55	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	14/01/2022	0089_MW228_220114	Normal	EP2200399	0.21	0.11	0.10	<0.02	<0.01	<0.02	2.0	8.90	12.0	2.42	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	16/03/2022	0089_MW228_220316	Normal	EP2203057	0.21	0.10	0.15	<0.02	<0.01	<0.02	2.1	8.23	10.8	2.38	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	7/06/2022	0089_MW228_220607	Normal	EP2206888	0.11	0.08	0.09	<0.02	<0.01	<0.02	1.6	7.48	7.21	1.56	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW228	7/09/2022	0089_MW228_220907	Normal	EP2211495	0.08	0.06	0.12	<0.02	<0.01	<0.02	0.7	2.90	3.03	0.94	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Infiltration Swale	MW233	8/08/2017	0089_MW233_S_170808	Normal	199212	0.011	0.016	0.21	0.002	0.2	<0.002	0.008	0.004	0.016	0.006	0.005	0.002	0.003	0.003	<0.005	<0.01	<0.05
	MW233	13/09/2017	0089_MW233_S_170913	Normal	175739	0.007	0.01	0.11	0.002	0.26	<0.002	0.008	0.007	0.016	0.008	0.006	<0.001	<0.002	0.002	<0.005	<0.01	<0.05
	MW233	20/10/2017	0089_MW233_S_171020	Normal	178263	0.005	0.009	0.093	0.004	0.30	<0.002	0.005	0.004	0.011	0.005	0.011	<0.001	<0.002	0.003	<0.005	<0.01	<0.05
	MW233	21/11/2017	0089_MW233_S_171121	Normal	203587	0.013	0.020	0.14	0.005	0.33	<0.002	0.007	0.006	0.018	0.010	0.010	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW233	5/12/2017	0089_MW233_S_171205	Normal	204183	0.016	0.019	0.20	0.006	0.30	<0.002	0.01	0.006	0.020	0.009	0.010	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW233	19/01/2018	0089_MW233_S_180119	Normal	205805	0.013	0.013	0.11	0.007	0.53	0.002	0.020	0.020	0.043	0.020	0.040	0.002	<0.002	0.002	<0.005	<0.01	<0.05
	MW233	8/01/2020	0089_MW233_200108	Normal	EP2000182	<0.02	<0.02	0.13	<0.02	0.39	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	30/03/2020	0089_MW233_200330	Normal	EP2003313	<0.02	<0.02	0.07	<0.02	0.30	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	15/07/2020	0089_MW233_200715	Normal	EP2007385	<0.02	<0.02	0.11	<0.02	0.15	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	15/07/2020	0089_QC107_200715	Field Duplicate	EP2007385	<0.02	<0.02	0.11	<0.02	0.13	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	15/07/2020	0089_QC207_200215	Interlab Duplicate	732844	<0.01	0.01	0.09	<0.01	0.11	<0.01	<0.05	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW233	21/09/2020	0089_MW233_200921	Normal	EP2010085	<0.02	<0.02	0.12	<0.02	0.17	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	15/12/2020	0089_MW233_201215	Normal	EP2014041	<0.02	<0.02	0.14	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	15/03/2021	0089_MW233_210315	Normal	EP2102755	<0.02	<0.02	0.10	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	15/03/2021	0089_QC104_210315	Field Duplicate	EP2102755	<0.02	<0.02	0.14	<0.02	0.12	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	15/03/2021	0089_QC204_210315	Interlab Duplicate	781350	<0.01	<0.01	0.11	<0.01	0.10	<0.01	<0.05	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW233	9/06/2021	0089_MW233_210609	Normal	EP2106515	<0.02	<0.02	0.08	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	30/08/2021	0089_MW233_210830	Normal	EP2110016	<0.02	<0.02	0.07	<0.02	0.34	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	30/08/2021	0089_QC102_210830	Field Duplicate	EP2110016	<0.02	<0.02	0.10	<0.02	0.27	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	30/08/2021	0089_QC202_210830	Interlab Duplicate	820919	<0.01	<0.01	0.06	<0.01	0.28	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW233	10/01/2022	0089_MW233_220110	Normal	EP2200216	<0.02	<0.02	0.01	<0.02	0.34	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	17/03/2022	0089_MW233_220317	Normal	EP2203138	<0.02	<0.02	0.01	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
	MW233	8/06/2022	0089_MW233_220608	Normal	EP2206969	<0.02	<0.02	0.02	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW233	6/09/2022	0089_MW233_220906	Normal	EP2211390	<0.02	<0.02	0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fuel Farm	MW236	8/08/2017	0089_MW236_S_170808	Normal	199212	0.68	2	31	0.11	12	<0.002	0.2	0.23	2.3	1.2	*1.1*	1.3	<0.002	<0.002	<0.005	<0.01	<0.05
	MW236	13/09/2017	0089_MW236_S_170913	Normal	175739	1.8	4.6	32	0.23	12	<0.002	0.31	0.22	3.3	0.90	*1.1*	0.99	<0.002	<0.002	<0.005	<0.01	<0.05
	MW236	20/10/2017	0089_MW236_S_171020	Normal	178263	1.4	3.8	27	0.14	18	<0.02	0.24	0.58	3.9	1.2	*1.2*	1.2	<0.02	<0.02	<0.05	<0.1	<0.5
	MW236	21/11/2017	0089_MW236_S_171121	Normal	203587	1.6	4.1	26	0.26	16	<0.002	0.28	0.51	4.0	1.2	*0.99*	1.4	<0.002	<0.002	<0.005	<0.01	<0.05
	MW236	5/12/2017	0089_MW236_S_171205	Normal	204183	2.3	5.9	29	0.21	16	<0.020	0.33	0.40	4.2	0.88	*1.1*	1.9	<0.02	<0.02	<0.050	<0.1	<0.5
	MW236	19/01/2018	0089_MW236_S_180119	Normal	205805	1.6	3.9	28	0.32	17	<0.02	0.37	0.40	4.1	1.7	*1.4*	2.5	<0.02	<0.02	<0.05	<0.1	<0.5
	MW236	2/04/2020	0089_MW236_200402	Normal	EP2003472	0.15	0.42	19.8	0.50	67.7	<0.02	<0.1	0.19	0.82	0.42	*1.73*	3.16	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	16/07/2020	0089_MW236_200716	Normal	EP2007438	0.16	0.64	19.8	0.86	55.2	<0.02	<0.1	0.16	0.90	0.38	*1.46*	3.24	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	16/07/2020	0089_QC108_200716	Field Duplicate	EP2007438	0.18	0.73	20.9	0.90	62.0	<0.02	<0.1	0.17	0.99	0.41	*1.62*	3.42	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	20/07/2020	0089_QC208_200716	nterlab Duplicate	733018	0.13	0.34	16	0.32	59	<0.01	0.08	0.14	0.79	0.31	*1.2*	3.1	<0.01	<0.01	<0.01	<0.01	<0.01
	MW236	21/09/2020	0089_MW236_200921	Normal	EP2010077	0.33	1.53	23.2	1.09	60.6	<0.02	<0.1	0.20	1.39	0.48	*1.44*	2.79	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	15/12/2020	0089_MW236_201215	Normal	EP2014041	0.30	0.63	14.9	0.37	42.6	<0.02	<0.1	0.16	0.93	0.38	*1.06*	2.08	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	16/03/2021	0089_MW236_210316	Normal	EP2102833	0.45	1.28	17.8	0.66	53.4	<0.02	0.1	0.25	1.72	0.50	*1.24*	3.15	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	10/06/2021	0089_MW236_210610	Normal	EP2106579	0.18	0.36	11.3	0.50	42.2	<0.02	<0.1	0.12	0.78	0.25	*1.27*	1.98	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	31/08/2021	0089_MW236_210831	Normal	EP2110073	0.46	2.64	34.8	0.49	26.0	<0.02	0.1	0.22	1.67	0.90	*1.74*	2.09	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	10/01/2022	0089_MW236_220110	Normal	EP2200211	0.33	1.43	34.6	0.76	49.9	<0.02	0.1	0.21	1.93	0.84	*2.41*	3.04	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	7/06/2022	0089_MW236_220607	Normal	EP2206880	0.08	0.34	18.1	0.95	84.7	<0.02	<0.1	0.11	0.67	0.36	*1.68*	4.88	<0.02	<0.02	<0.02	<0.02	<0.05
	MW236	6/09/2022	0089_MW236_220906	Normal	EP2211390	0.39	1.17	48.1	0.49	68.9	<0.02	0.1	0.21	1.35	0.87	*1.70*	3.35	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage	MW238	4/08/2017	0089_MW238_S_170804	Normal	199095	0.002	0.002	0.008	<0.001	0.005	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW238	13/09/2017	0089_MW238_S_170913	Normal	175739	0.001	0.002	0.022	<0.001	0.008	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW238	13/09/2017	0089_QC1MW_170913	Field Duplicate	175739	0.002	0.002	0.008	<0.001	0.01	<0.002	0.002	<0.002	0.002	<0.001	0.001	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW238	13/09/2017	0089_QC2MW_170913	nterlab Duplicate	565731	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW238	20/10/2017	0089_MW238_S_171020	Normal	178263	0.001	0.001	0.004	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW238	21/11/2017	0089_MW238_S_171121	Normal	203587	0.002	<0.001	0.004	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW238	5/12/2017	0089_MW238_S_171205	Normal	204183	0.001	<0.001	0.005	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW238	19/01/2018	0089_MW238_S_180119	Normal	205805	0.002	0.001	0.006	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW238	14/01/2020	0089_MW238_200114	Normal	EP2000432	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	1/04/2020	0089_MW238_200401	Normal	EP2003438	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	16/07/2020	0089_MW238_200716	Normal	EP2007438	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	21/09/2020	0089_MW238_200921	Normal	EP2010077	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	15/12/2020	0089_MW238_201215	Normal	EP2014041	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	15/12/2020	0089_QC114_201215	Field Duplicate	EP2014041	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	15/12/2020	0089_QC214_201115	nterlab Duplicate	765054	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW238	18/03/2021	0089_MW238_210318	Normal	EP2102955	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	10/06/2021	0089_MW238_210610	Normal	EP2106580	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	31/08/2021	0089_MW238_210831	Normal	EP2110073	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	12/01/2022	0089_MW238_220112	Normal	EP2200288	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	18/03/2022	0089_MW238_220318	Normal	EP2203194	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	9/06/2022	0089_MW238_220609	Normal	EP2207028	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW238	6/09/2022	0089_MW238_220906	Normal	EP2211389	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage	MW239	4/08/2017	0089_MW239_S_170804	Normal	199095	0.001	<0.001	0.008	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW239	22/07/2020	0089_MW239_200722	Normal	EP2007648	0.03	0.04	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW239	21/09/2020	0089_MW239_200921	Normal	EP2010077	0.06	0.08	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW239	15/12/2020	0089_MW239_201215	Normal	EP2014041	0.03	0.05	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW239	18/03/2021	0089_MW239_210318	Normal	EP2102954	0.04	0.07	0.04	<0.02	<0.01	<0.02	<0.1	0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW239	10/06/2021	0089_MW239_210610	Normal	EP2106579	0.03	0.07	0.03	<0.02	0.01	<0.02	<0.1	<0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW239	31/08/2021	0089_MW239_210831	Normal	EP2110073	<0.02	0.03	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW239	12/01/2022	0089_MW239_220112	Normal	EP2200288	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW239	18/03/2022	0089_MW239_220318	Normal	EP2203194	<0.02	0.03	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW239	9/06/2022	0089_MW239_220609	Normal	EP2207028	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW239	6/09/2022	0089_MW239_220906	Normal	EP2211389	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage	MW240	4/08/2017	0089_MW240_S_170804	Normal	199095	0.014	0.051	3.5	0.006	0.002	<0.002	0.01	0.008	0.11	0.025	0.086	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW240	14/01/2020	0089_MW240_200114	Normal	EP2000432	0.02	0.18	5.10	0.09	<0.01	<0.02	<0.1	0.03	0.25	0.05	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	1/04/2020	0089_MW240_200401	Normal	EP2003438	<0.02	0.04	0.98	0.03	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	16/07/2020	0089_MW240_200716	Normal	EP2007438	<0.02	0.06	0.78	0.03	0.03	<0.02	<0.1	<0.02	0.04	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	21/09/2020	0089_MW240_200921	Normal	EP2010077	0.03	0.43	5.00	0.10	<0.01	<0.02	<0.1	0.02	0.33	0.07	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	21/09/2020	0089_QC106_200921	Field Duplicate	EP2010077	0.02	0.28	3.51	0.07	<0.01	<0.02	<0.1	<0.02	0.24	0.05	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	21/09/2020	0089_QC206_200921	nterlab Duplicate	746269	0.02	0.14	2.7	0.04	<0.01	<0.01	<0.05	0.02	0.16	0.03	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW240	15/12/2020	0089_MW240_201215	Normal	EP2014041	<0.02	0.09	1.34	0.02	<0.01	<0.02	<0.1	<0.02	0.11	0.03	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	18/03/2021	0089_MW240_210318	Normal	EP2102954	0.02	0.08	3.26	0.20	<0.01	<0.02	<0.1	0.02	0.18	0.03	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	10/06/2021	0089_MW240_210610	Normal	EP2106580	0.02	0.21	3.24	0.12	<0.01	<0.02	<0.1	0.02	0.21	0.03	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	31/08/2021	0089_MW240_210831	Normal	EP2110073	0.02	0.27	4.21	0.06	<0.01	<0.02	<0.1	0.03	0.25	0.06	0.13	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	12/01/2022	0089_MW240_220112	Normal	EP2200288	<0.02	<0.02	0.69	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	12/01/2022	0089_QC115_220112	Field Duplicate	EP2200288	<0.02	<0.02	0.69	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	12/01/2022	0089_QC215_220112	nterlab Duplicate	855202	<0.01	<0.01	0.65	<0.01	0.01	<0.01	<0.05	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW240	18/03/2022	0089_MW240_220318	Normal	EP2203194	<0.02	<0.02	1.07	<0.02	<0.01	<0.02	<0.1	<0.02	0.08	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	9/06/2022	0089_MW240_220609	Normal	EP2207028	<0.02	0.24	4.46	0.07	<0.01	<0.02	<0.1	0.02	0.20	0.05	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW240	6/09/2022	0089_MW240_220906	Normal	EP2211389	<0.02	0.06	3.80	<0.02	<0.01	<0.02	<0.1	<0.02	0.16	0.04	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage	MW242	7/08/2017	0089_MW242_S_170807	Normal	199149	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW242	8/01/2020	0089_MW242_200108	Normal	EP2000182	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	30/03/2020	0089_MW242_200330	Normal	EP2003313	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	16/07/2020	0089_MW242_200716	Normal	EP2007438	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	21/09/2020	0089_MW242_200921	Normal	EP2010077	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	15/12/2020	0089_MW242_201215	Normal	EP2014041	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	18/03/2021	0089_MW242_210318	Normal	EP2102954	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	9/06/2021	0089_MW242_210609	Normal	EP2106516	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	31/08/2021	0089_MW242_210831	Normal	EP2110073	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	12/01/2022	0089_MW242_220112	Normal	EP2200288	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	17/03/2022	0089_MW242_220317	Normal	EP2203138	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	8/06/2022	0089_MW242_220608	Normal	EP2206969	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW242	6/09/2022	0089_MW242_220906	Normal	EP2211389	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	4/08/2017	0089_MW243_S_170804	Normal	199095	0.003	0.004	0.045	0.012	0.16	<0.002	0.008	0.003	0.009	0.002	0.018	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
AVCAT Storage	MW243	13/09/2017	0089_MW243_S_170913	Normal	175739	0.002	<0.001	0.029	0.004	0.047	<0.002	0.002	<0.002	0.003	<0.001	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW243	20/10/2017	0089_MW243_S_171020	Normal	178263	0.002	0.002	0.016	0.001	0.021	<0.002	<0.002	<0.002	0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW243	21/11/2017	0089_MW243_S_171121	Normal	203587	0.001	<0.001	0.006	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW243	5/12/2017	0089_MW243_S_171205	Normal	204183	0.001	<0.001	0.005	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW243	19/01/2018	0089_MW243_S_180119	Normal	205805	0.001	0.002	0.044	0.027	0.83	<0.002	0.01	0.003	0.005	<0.001	0.008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW243	14/01/2020	0089_MW243_200114	Normal	EP2000432	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	1/04/2020	0089_MW243_200401	Normal	EP2003438	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	16/07/2020	0089_MW243_200716	Normal	EP2007438	<0.02	<0.02	0.03	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	21/09/2020	0089_MW243_200921	Normal	EP2010077	<0.02	<0.02	0.04	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	15/12/2020	0089_MW243_201215	Normal	EP2014041	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	18/03/2021	0089_MW243_210318	Normal	EP2102955	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	10/06/2021	0089_MW243_210610	Normal	EP2106579	<0.02	<0.02	0.07	<0.02	0.70	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	31/08/2021	0089_MW243_210831	Normal	EP2110073	<0.02	<0.02	0.10	<0.02	0.43	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	12/01/2022	0089_MW243_220112	Normal	EP2200288	<0.02	<0.02	0.07	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	18/03/2022	0089_MW243_220318	Normal	EP2203194	<0.02	<0.02	0.04	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	9/06/2022	0089_MW243_220609	Normal	EP2207028	<0.02	<0.02	0.03	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW243	6/09/2022	0089_MW243_220906	Normal	EP2211389	<0.02	<0.02	0.11	<0.02	0.16	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage	MW245	4/08/2017	0089_MW245_S_170804	Normal	199095	<0.001	<0.001	0.19	0.017	0.62	<0.002	0.96	<0.002	0.033	<0.001	0.022	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW245	13/09/2017	0089_MW245_S_170913	Normal	175739	0.002	0.005	0.039	0.003	0.31	<0.002	<0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW245	20/10/2017	0089_MW245_S_171020	Normal	178263	<0.010	<0.010	0.14	0.006	0.55	<0.020	<0.020	<0.020	0.015	<0.010	<0.010	<0.010	<0.020	<0.020	<0.050	<0.10	<0.50
	MW245	21/11/2017	0089_MW245_S_171121	Normal	203587	0.011	0.027	0.20	0.007	0.40	<0.002	0.22	<0.002	0.010	0.001	0.009	0.001	0.002	<0.002	<0.005	<0.01	<0.05
	MW245	5/12/2017	0089_MW245_S_171205	Normal	204183	<0.005	0.080	0.14	0.008	0.37	<0.002	<0.01	<0.01	0.041	<0.001	0.007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW245	19/01/2018	0089_MW245_S_180119	Normal	205805	0.005	0.007	0.078	0.004	0.22	<0.002	<0.02	<0.002	0.031	0.004	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW245	14/01/2020	0089_MW245_200114	Normal	EP2000432	<0.02	<0.02	<0.02	<0.02	0.35	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	1/04/2020	0089_MW245_200401	Normal	EP2003438	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	16/07/2020	0089_MW245_200716	Normal	EP2007438	<0.02	<0.02	0.16	<0.02	0.18	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	21/09/2020	0089_MW245_200921	Normal	EP2010077	<0.02	<0.02	0.12	<0.02	0.20	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	15/12/2020	0089_MW245_201215	Normal	EP2014041	<0.02	<0.02	0.03	<0.02	0.15	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	18/03/2021	0089_MW245_210318	Normal	EP2102955	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	10/06/2021	0089_MW245_210610	Normal	EP2106579	<0.02	<0.02	0.05	<0.02	0.14	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	31/08/2021	0089_MW245_210831	Normal	EP2110073	<0.02	<0.02	0.03	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	12/01/2022	0089_MW245_220112	Normal	EP2200288	<0.02	<0.02	<0.01	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	18/03/2022	0089_MW245_220318	Normal	EP2203194	<0.02	<0.02	0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	9/06/2022	0089_MW245_220609	Normal	EP2207028	<0.02	<0.02	0.04	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW245	6/09/2022	0089_MW245_220906	Normal	EP2211389	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
AVCAT Storage	MW249	7/08/2017	0089_MW249_S_170807	Normal	199149	0.014	0.065	1.8	0.012	0.45	<0.002	<0.002	<0.002	0.15	0.017	0.079	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW249	13/09/2017	0089_MW249_S_170913	Normal	175739	0.015	0.052	1.7	0.014	0.57	<0.002	0.004	0.008	0.14	0.024	0.052	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW249	20/10/2017	0089_MW249_S_171020	Normal	178263	0.012	0.060	1.4	0.044	0.57	<0.002	0.004	0.01	0.13	0.014	0.083	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW249	21/11/2017	0089_MW249_S_171121	Normal	203587	0.010	0.040	1.4	0.021	0.39	<0.002	0.003	0.007	0.10	0.011	0.060	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW249	5/12/2017	0089_MW249_S_171205	Normal	204183	0.012	0.042	1.4	0.021	0.50	<0.002	0.004	0.009	0.13	0.010	0.069	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW249	19/01/2018	0089_MW249_S_180119	Normal	205805	0.007	0.030	0.60	0.020	0.21	<0.002	<0.002	0.004	0.061	0.005	0.026	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW249	8/01/2020	0089_MW249_200108	Normal	EP2000182	<0.02	<0.02	0.28	<0.02	0.16	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	30/03/2020	0089_MW249_200330	Normal	EP2003313	<0.02	<0.02	0.12	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	16/07/2020	0089_MW249_200716	Normal	EP2007438	<0.02	<0.02	0.07	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	16/07/2020	0089_QC110_200716	Field Duplicate	EP2007438	<0.02	<0.02	0.09	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	20/07/2020	0089_QC210_200716	nterlab Duplicate	733018	<0.01	<0.01	0.08	<0.01	0.06	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW249	21/09/2020	0089_MW249_200921	Normal	EP2010077	<0.02	0.03	0.80	<0.02	0.49	<0.02	<0.1	<0.02	0.03	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	21/09/2020	0089_QC109_200921	Field Duplicate	EP2010077	<0.02	0.02	0.84	<0.02	0.50	<0.02	<0.1	<0.02	0.03	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	21/09/2020	0089_QC209_200921	nterlab Duplicate	746269	<0.01	0.02	0.59	<0.01	0.38	<0.01	<0.05	<0.01	0.02	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW249	15/12/2020	0089_MW249_201215	Normal	EP2014041	<0.02	<0.02	0.15	<0.02	0.15	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	15/03/2021	0089_MW249_210315	Normal	EP2102755	<0.02	<0.02	0.11	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	9/06/2021	0089_MW249_210609	Normal	EP2106515	<0.02	<0.02	0.14	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	31/08/2021	0089_MW249_210831	Normal	EP2110071	<0.02	<0.02	0.13	<0.02	0.14	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	12/01/2022	0089_MW249_220112	Normal	EP2200288	<0.02	<0.02	0.15	<0.02	0.11	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	17/03/2022	0089_MW249_220317	Normal	EP2203138	<0.02	<0.02	0.07	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	8/06/2022	0089_MW249_220608	Normal	EP2206969	<0.02	0.02	0.21	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW249	6/09/2022	0089_MW249_220906	Normal	EP2211389	<0.02	<0.02	0.15	<0.02	0.08	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Station	MW255	4/08/2017	0089_MW255_S_170804	Normal	199095	0.71	1.0	1.0	0.031	1.1	<0.002	0.16	0.23	1.4	0.10	0.043	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW255	13/09/2017	0089_MW255_S_170913	Normal	175739	1.6	1.4	0.85	0.015	1.2	<0.002	0.27	0.17	1.7	0.097	0.039	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW255	20/10/2017	0089_MW255_S_171020	Normal	178263	1.6	1.0	0.60	0.016	1.0	<0.002	0.34	0.74	2.6	0.093	0.045	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW255	21/11/2017	0089_MW255_S_171121	Normal	203587	2.5	1.5	0.70	0.019	0.76	<0.002	0.46	0.84	3.7	0.086	0.036	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW255	8/12/2017	0089_MW255_S_171208	Normal	204353	2.4	1.9	0.64	0.014	1.3	<0.002	0.46	0.70	4.2	0.098	0.044	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW255	19/01/2018	0089_MW255_S_180119	Normal	205805	2.1	1.2	0.71	0.020	0.90	<0.002	0.40	0.63	4.0	0.11	0.043	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW255	16/07/2020	0089_MW255_200716	Normal	EP2007438	0.09	0.19	1.26	<0.02	0.78	<0.02	<0.1	0.07	0.30	0.06	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	16/07/2020	0089_QC109_200716	Field Duplicate	EP2007438	0.09	0.21	1.40	<0.02	1.07	<0.02	<0.1	0.07	0.33	0.07	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	20/07/2020	0089_QC209_200716	nterlab Duplicate	733018	0.08	0.15	1.3	0.03	0.69	0.02	0.05	0.11	0.27	0.07	0.04	<0.01	0.01	0.02	<0.01	<0.01	0.01
	MW255	22/09/2020	0089_MW255_200922	Normal	EP2010141	0.45	1.54	14.2	0.05	1.13	<0.02	0.1	0.24	1.55	0.63	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	22/09/2020	0089_QC114_200922	Field Duplicate	EP2010141	0.52	1.20	14.0	0.05	1.57	<0.02	0.2	0.31	1.66	0.62	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	22/09/2020	0089_QC214_200921	nterlab Duplicate	746269	0.28	0.79	9.7	0.03	0.89	<0.01	0.12	0.18	0.99	0.42	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW255	16/12/2020	0089_MW255_201216	Normal	EP2014106	0.10	0.22	2.44	<0.02	0.94	<0.02	<0.1	0.07	0.31	0.12	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	17/03/2021	0089_MW255_210317	Normal	EP2102900	0.10	0.07	1.05	<0.02	0.65	<0.02	<0.1	0.04	0.19	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	10/06/2021	0089_MW255_210610	Normal	EP2106580	0.07	0.08	1.15	<0.02	0.53	<0.02	<0.1	0.04	0.17	0.04	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	31/08/2021	0089_MW255_210831	Normal	EP2110073	0.12	0.47	6.89	0.02	0.90	<0.02	<0.1	0.08	0.44	0.19	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	10/01/2022	0089_MW255_220110	Normal	EP2200211	0.06	0.04	0.66	<0.02	0.40	<0.02	<0.1	0.02	0.11	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	17/03/2022	0089_MW255_220317	Normal	EP2203138	0.11	0.06	0.55	<0.02	0.32	<0.02	<0.1	0.04	0.23	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	9/06/2022	0089_MW255_220609	Normal	EP2207028	<0.05	0.09	1.40	<0.02	0.14	<0.02	<0.1	<0.05	0.10	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW255	6/09/2022	0089_MW255_220906	Normal	EP2211389	0.13	0.33	0.94	<0.02	0.95	<0.02	<0.1	0.09	0.52	0.19	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	4/08/2017	0089_MW256_S_170804	Normal	199095	0.042	0.043	0.49	0.028	4.8	<0.002	0.049	0.080	0.20	0.063	0.095	0.006	<0.002	<0.002	<0.005	<0.01	<0.05
	MW256	13/09/2017	0089_MW256_S_170913	Normal	175739	0.059	0.035	0.49	0.017	4.5	<0.002	0.062	0.077	0.16	0.068	0.093	0.006	<0.002	<0.002	<0.005	<0.01	<0.05
	MW256	20/10/2017	0089_MW256_S_171020	Normal	178263	0.067	0.084	0.61	0.061	3.9	<0.002	0.051	0.12	0.26	0.082	0.15	0.01	<0.002	<0.002	<0.005	<0.01	<0.05
	MW256	21/11/2017	0089_MW256_S_171121	Normal	203587	0.10	0.12	0.87	0.088	2.4	<0.002	0.068	0.20	0.42	0.090	0.16	0.011	<0.002	<0.002	<0.005	<0.01	<0.05
	MW256	8/12/2017	0089_MW256_S_171208	Normal	204353	0.10	0.079	1.1	0.063	3.6	<0.002	0.078	0.16	0.53	0.18	0.19	0.010	<0.002	<0.002	<0.005	<0.01	<0.05
	MW256	19/01/2018	0089_MW256_S_180119	Normal	205805	0.093	0.20	0.98	0.11	3.0	0.020	0.074	0.12	0.52	0.099	0.18	0.012	<0.002	<0.002	<0.005	<0.01	<0.05
	MW256	30/03/2020	0089_MW256_200330	Normal	EP2003313	1.08	1.13	9.14	0.44	8.05	<0.02	0.2	0.90	2.82	0.35	*0.67*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Fire Station	MW256	16/07/2020	0089_MW256_200716	Normal	EP2007438	0.60	0.90	4.95	0.22	6.96	0.05	0.1	0.34	1.60	0.19	0.31	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	22/09/2020	0089_MW256_200922	Normal	EP2010141	0.48	0.76	7.71	0.68	14.3	0.05	0.2	0.60	2.81	0.26	*0.60*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	14/12/2020	0089_MW256_201214	Normal	EP2013975	0.25	0.30	3.47	0.30	6.33	<0.02	0.1	0.33	1.34	0.11	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	17/03/2021	0089_MW256_210317	Normal	EP2102900	0.25	0.32	3.65	0.29	6.55	<0.02	<0.1	0.34	1.38	0.12	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	10/06/2021	0089_MW256_210610	Normal	EP2106579	1.28	3.05	38.8	2.11	36.2	<0.02	0.3	0.67	3.96	0.70	*2.34*	0.10	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	10/06/2021	0089_QC113_210610	Field Duplicate	EP2106579	1.40	2.68	34.4	1.88	30.6	<0.02	0.3	0.70	4.21	0.76	*2.45*	0.10	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	10/06/2021	0089_QC213_210610	nterlab Duplicate	802734	1.8	3.0	27	2.4	29	<0.01	0.41	0.67	3.9	0.77	*2.3*	0.11	<0.01	<0.01	<0.01	<0.01	<0.01
	MW256	31/08/2021	0089_MW256_210831	Normal	EP2110064	1.67	0.83	6.42	0.26	12.0	<0.02	0.6	0.78	2.34	0.19	0.45	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	10/01/2022	0089_MW256_220110	Normal	EP2200211	0.67	0.57	4.99	0.32	8.18	<0.02	0.4	0.67	3.02	0.20	0.39	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	10/01/2022	0089_QC110_220110	Field Duplicate	EP2200211	0.62	0.54	4.67	0.32	7.68	<0.02	0.4	0.63	2.79	0.19	0.37	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	10/01/2022	0089_QC210_220110	nterlab Duplicate	854607	0.42	0.46	3.4	0.24	8.6	<0.01	0.34	0.47	1.5	0.13	0.34	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW256	17/03/2022	0089_MW256_220317	Normal	EP2203138	3.22	1.54	10.7	0.55	10.7	0.02	1.1	1.47	5.22	0.41	*0.72*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	9/06/2022	0089_MW256_220609	Normal	EP2207028	0.51	0.44	3.12	0.39	10.7	<0.02	0.2	0.40	1.32	0.16	0.42	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW256	6/09/2022	0089_MW256_220906	Normal	EP2211389	0.93	0.41	3.32	0.15	9.10	<0.02	0.6	0.59	1.19	0.11	0.19	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Flammable / hazardous goods and waste storage area	MW257	4/08/2017	0089_MW257_S_170804	Normal	199095	<0.001	<0.001	0.005	<0.001	0.015	<0.002	0.003	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW257	13/09/2017	0089_MW257_S_170913	Normal	175739	0.002	<0.001	0.01	<0.001	0.038	<0.002	0.006	0.004	0.004	0.001	0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW257	20/10/2017	0089_MW257_S_171020	Normal	178263	0.003	0.002	0.013	<0.001	0.050	<0.002	0.007	0.005	0.006	<0.001	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW257	21/11/2017	0089_MW257_S_171121	Normal	203587	0.014	0.006	0.076	0.007	0.30	<0.002	0.020	0.026	0.040	0.006	0.005	0.002	<0.002	<0.002	<0.005	<0.01	<0.05
	MW257	8/12/2017	0089_MW257_S_171208	Normal	204353	0.006	0.003	0.029	<0.001	0.19	<0.002	0.01	0.01	0.020	0.002	0.003	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW257	19/01/2018	0089_MW257_S_180119	Normal	205805	0.003	<0.001	0.011	<0.001	0.008	<0.002	0.008	0.002	0.004	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW257	19/12/2019	0089_MW257_191219	Normal	EP1913598	<0.02	<0.02	0.05	<0.02	0.04	<0.02	<0.1	0.02	0.02	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	2/04/2020	0089_MW257_200402	Normal	EP2003472	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	16/07/2020	0089_MW257_200716	Normal	EP2007438	<0.02	<0.02	0.02	0.03	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	22/09/2020	0089_MW257_200922	Normal	EP2010141	<0.02	<0.02	0.53	0.15	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	16/12/2020	0089_MW257_201216	Normal	EP2014106	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	18/03/2021	0089_MW257_210318	Normal	EP2102954	<0.02	<0.02	0.06	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	9/06/2021	0089_MW257_210609	Normal	EP2106516	<0.02	<0.02	0.03	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	31/08/2021	0089_MW257_210831	Normal	EP2110073	<0.02	0.03	0.90	0.10	0.08	<0.02	<0.1	0.03	0.06	0.02	0.12	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	10/01/2022	0089_MW257_220110	Normal	EP2200211	<0.02	<0.02	0.03	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	17/03/2022	0089_MW257_220317	Normal	EP2203138	<0.02	<0.02	0.06	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	9/06/2022	0089_MW257_220609	Normal	EP2207028	<0.02	<0.02	<0.05	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW257	6/09/2022	0089_MW257_220906	Normal	EP2211389	<0.02	<0.02	0.16	<0.02	0.20	<0.02	<0.1	0.04	0.05	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Flammable / hazardous goods and waste storage area	MW258	4/08/2017	0089_MW258_S_170804	Normal	199095	2.8	2.0	10	0.44	5.2	<0.002	0.63	1.2	3.4	0.39	0.52	0.002	<0.002	<0.002	<0.005	<0.01	<0.05
	MW258	13/09/2017	0089_MW258_S_170913	Normal	175739	4.0	3.0	11	0.79	6.5	<0.002	0.94	0.50	3.2	0.27	0.42	0.003	<0.002	<0.002	<0.005	<0.01	<0.05
	MW258	20/10/2017	0089_MW258_S_171020	Normal	178263	3.1	2.4	10	0.42	5.3	<0.02	0.58	1.3	3.7	0.37	0.53	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW258	21/11/2017	0089_MW258_S_171121	Normal	203587	4.4	2.8	9.8	0.58	5.8	<0.002	0.76	1.3	4.4	0.38	0.49	0.003	<0.002	<0.002	<0.005	<0.01	<0.05
	MW258	8/12/2017	0089_MW258_S_171208	Normal	204353	3.6	2.4	11	0.54	10	<0.002	0.66	1.1	4.6	0.34	0.47	0.002	<0.002	<0.002	<0.005	<0.01	<0.05
	MW258	19/01/2018	0089_MW258_S_180119	Normal	205805	4.6	2.7	12	0.56	5.5	<0.02	1.1	1.2	5.0	0.57	0.52	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW258	8/06/2022	0089_MW258_220608	Normal	EP2206971	1.30	0.84	2.35	0.08	2.06	<0.02	0.2	0.43	1.30	0.10	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW258	6/09/2022	0089_MW258_220906	Normal	EP2211389	6.69	5.32	15.7	0.42	9.12	<0.02	1.5	2.99	9.00	0.83	*0.58*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Flammable / hazardous goods and waste storage area	MW259	4/08/2017	0089_MW259_S_170804	Normal	199095	1.0	0.87	4.4	0.35	14	<0.002	0.34	0.67	1.8	0.16	0.28	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW259	13/09/2017	0089_MW259_S_170913	Normal	175739	1.1	1.0	3.6	0.34	13	<0.002	0.61	0.51	1.3	0.14	0.22	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW259	20/10/2017	0089_MW259_S_171020	Normal	178263	0.81	0.76	3.3	0.30	13	<0.02	0.27	0.67	1.4	0.11	0.26	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW259	21/11/2017	0089_MW259_S_171121	Normal	203587	1.2	0.87	4.0	0.40	14	<0.002	0.34	0.63	1.7	0.12	0.20	0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW259	8/12/2017	0089_MW259_S_171208	Normal	204353	0.90	0.86	3.6	0.81	23	<0.002	0.23	0.46	1.5	0.12	0.20	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW259	19/01/2018	0089_MW259_S_180119	Normal	205805	3.3	2.0	7.9	1.1	23	<0.02	1.2	1.9	4.7	0.40	0.56	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW259	16/07/2020	0089_MW259_200716	Normal	EP2007438	0.15	1.02	2.19	0.03	1.01	<0.02	1.2	5.55	4.05	0.20	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW259	22/09/2020	0089_MW259_200922	Normal	EP2010141	0.16	0.81	1.59	0.03	0.77	<0.02	0.3	1.42	2.16	0.12	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW259	16/12/2020	0089_MW259_201216	Normal	EP2014092	<0.02	0.07	0.14	<0.02	0.37	<0.02	<0.1	0.11	0.20	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW259	18/03/2021	0089_MW259_210318	Normal	EP2102954	0.02	0.02	0.08	<0.02	0.36	<0.02	<0.1	0.07	0.13	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW259	10/06/2021	0089_MW259_210610	Normal	EP2106580	<0.02	0.04	0.13	<0.02	0.41	<0.02	<0.1	0.09	0.16	0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW259	31/08/2021	0089_MW259_210831	Normal	EP2110073	<0.02	<0.02	0.02	<0.02	0.12	<0.02	<0.1	0.08	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW259	11/01/2022	0089_MW259_220111	Normal	EP2200241	<0.02	<0.02	<0.01	<0.02	0.13	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW259	17/03/2022	0089_MW259_220317	Normal	EP2203138	0.02	0.02	0.08	<0.02	0.18	<0.02	0.1	0.54	0.44	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW259	9/06/2022	0089_MW259_220609	Normal	EP2207028	<0.02	<0.05	<0.05	<0.02	0.11	<0.02	<0.2	0.16	0.09	<0.05	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW259	6/09/2022	0089_MW259_220906	Normal	EP2211389	0.03	0.08	0.22	<0.02	0.18	<0.02	<0.1	0.13	0.17	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Ship sullage area	MW261	12/01/2017	E06_B88_MB01_170112	Normal	530261					<0.01						<0.01						
	MW261	4/08/2017	0089_MW261_S_170804	Normal	199095	0.021	0.030	0.020	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW261	26/09/2019	0089_MW261_190926	Normal	679542	0.011	0.008	0.039	<0.001	0.0018	0.003	0.005	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	MW261	25/10/2019	0089_MW261_191025	Normal	EP1911020	<0.02	<0.02	0.09	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	19/12/2019	0089_MW261_191219	Normal	EP1913595	<0.02	0.02	0.16	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	19/12/2019	0089_QC102_191219	Field Duplicate	EP1913595	<0.02	<0.02	0.09	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	19/12/2019	0089_QC202_191219	nterlab Duplicate	695528	0.03	0.04	0.23	0.02	0.53	<0.01	<0.05	<0.01	0.09	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW261	30/03/2020	0089_MW261_200330	Normal	EP2003313	<0.02	<0.02	0.16	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	21/07/2020	0089_MW261_200721	Normal	EP2007611	<0.02	0.02	0.19	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	22/09/2020	0089_MW261_200922	Normal	EP2010141	0.03	<0.02	0.46	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	16/12/2020	0089_MW261_201216	Normal	EP2014087	<0.02	<0.02	0.23	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	18/03/2021	0089_MW261_210318	Normal	EP2102954	0.03	<0.02	0.26	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	9/06/2021	0089_MW261_210609	Normal	EP2106516	<0.02	<0.02	0.11	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	31/08/2021	0089_MW261_210831	Normal	EP2110073	<0.02	<0.02	0.13	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	11/01/2022	0089_MW261_220111	Normal	EP2200241	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW261	17/03/2022	0089_MW261_220317	Normal	EP2203138	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge spoil	MW268	1/08/2017	0089_MW268_S_170801	Normal	198918	0.094	0.11	0.35	<0.001	<0.001	<0.002	0.005	<0.002	0.052	0.003	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW268	19/09/2017	0089_MW268_S_170919	Normal	176140	0.085	0.11	0.44	<0.001	0.005	<0.002	0.008	0.003	0.051	0.005	0.003	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW268	16/10/2017	0089_MW268_S_171016	Normal	177956	0.085	0.11	0.4	<0.001	0.002	<0.002	0.008	0.003	0.046	0.003	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW268	17/11/2017	0089_MW268_S_171117	Normal	203443	0.094	0.13	0.41	<0.001	0.002	<0.002	0.009	0.003	0.060	0.004	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW268	7/12/2017	0089_MW268_S_171207	Normal	204323	0.13	0.18	0.4	<0.001	0.031	<0.002	0.01	0.004	0.054	0.002	0.003	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW268	16/01/2018	0089_MW268_S_180116	Normal	205631	0.080	0.13	0.4	0.002	<0.001	<0.002	0.009	0.004	0.068	0.004	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW268	19/12/2019	0089_MW268_191219	Normal	EP1913595	0.10	0.12	0.76	<0.02	0.04	<0.02	<0.1	<0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	30/03/2020	0089_MW268_200330	Normal	EP2003313	0.08	0.11	0.49	<0.02	<0.01	<0.02	<0.1	<0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	21/07/2020	0089_MW268_200721	Normal	EP2007611	0.07	0.12	0.39	<0.02	<0.01	<0.02	<0.1	<0.02	0.10	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	21/09/2020	0089_MW268_200921	Normal	EP2010085	0.08	0.09	0.37	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	14/12/2020	0089_MW268_201214	Normal	EP2013975	0.03	0.04	0.2	<0.02	<0.01	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	16/03/2021	0089_MW268_210316	Normal	EP2102837	0.05	0.06	0.3	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
	MW268	16/03/2021	0089_QC116_210316	Field Duplicate	EP2102837	0.04	0.05	0.26	<0.02	<0.01	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	16/03/2021	0089_QC216_210316	Interlab Duplicate	781350	0.03	0.05	0.31	<0.01	<0.01	<0.01	<0.05	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW268	9/06/2021	0089_MW268_210609	Normal	EP2106515	0.05	0.09	0.28	<0.02	<0.01	<0.02	<0.1	<0.02	0.06	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	31/08/2021	0089_MW268_210831	Normal	EP2110073	0.06	0.09	0.41	<0.02	<0.01	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	11/01/2022	0089_MW268_220111	Normal	EP2200241	0.07	0.07	0.41	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	17/03/2022	0089_MW268_220317	Normal	EP2203138	0.07	0.06	0.33	<0.02	0.02	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	9/06/2022	0089_MW268_220609	Normal	EP2207028	0.05	0.07	0.41	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW268	6/09/2022	0089_MW268_220906	Normal	EP2211390	0.06	0.08	0.58	<0.02	<0.01	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	1/08/2017	0089_MW269_S_170801	Normal	198918	0.015	0.013	0.094	0.002	0.27	<0.002	0.006	0.01	0.023	0.002	0.002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW269	19/09/2017	0089_MW269_S_170919	Normal	176140	0.027	0.021	0.30	0.003	0.29	<0.002	0.01	0.020	0.054	0.011	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW269	16/10/2017	0089_MW269_S_171016	Normal	177956	0.041	0.040	0.34	0.002	0.27	<0.002	0.01	0.022	0.063	0.01	0.009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW269	17/11/2017	0089_MW269_S_171117	Normal	203443	0.031	0.042	0.40	0.006	0.27	<0.002	0.01	0.021	0.052	0.006	0.006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW269	7/12/2017	0089_MW269_S_171207	Normal	204323	0.012	0.009	0.082	0.002	0.18	<0.002	0.006	0.007	0.016	0.002	0.005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW269	16/01/2018	0089_MW269_S_180116	Normal	205631	0.032	0.034	0.31	0.010	0.24	<0.002	0.01	0.024	0.060	0.007	0.007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05
	MW269	19/12/2019	0089_MW269_191219	Normal	EP1913595	0.10	0.14	0.53	<0.02	1.03	<0.02	<0.1	0.04	0.20	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	30/03/2020	0089_MW269_200330	Normal	EP2003313	0.08	0.11	0.44	<0.02	0.67	<0.02	<0.1	0.04	0.14	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	21/07/2020	0089_MW269_200721	Normal	EP2007611	0.05	0.10	0.31	<0.02	0.51	<0.02	<0.1	0.02	0.13	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Dredge spoil	MW269	21/09/2020	0089_MW269_200921	Normal	EP2010085	0.07	0.10	0.39	<0.02	0.65	<0.02	<0.1	0.02	0.13	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	14/12/2020	0089_MW269_201214	Normal	EP2013975	0.04	0.06	0.30	<0.02	0.35	<0.02	<0.1	0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	16/03/2021	0089_MW269_210316	Normal	EP2102837	0.06	0.10	0.59	<0.02	0.48	<0.02	<0.1	0.03	0.12	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	9/06/2021	0089_MW269_210609	Normal	EP2106515	0.09	0.13	0.60	<0.02	0.45	<0.02	<0.1	0.03	0.13	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	31/08/2021	0089_MW269_210831	Normal	EP2110073	0.07	0.10	0.59	<0.02	0.41	<0.02	<0.1	0.03	0.14	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	11/01/2022	0089_MW269_220111	Normal	EP2200241	0.02	0.04	0.24	0.02	0.22	<0.02	<0.1	<0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	17/03/2022	0089_MW269_220317	Normal	EP2203138	0.06	0.10	0.52	<0.02	0.56	<0.02	<0.1	0.02	0.14	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	9/06/2022	0089_MW269_220609	Normal	EP2207028	0.05	0.09	0.61	<0.02	0.43	<0.02	<0.1	0.02	0.11	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW269	6/09/2022	0089_MW269_220906	Normal	EP2211390	0.06	0.09	0.63	<0.02	0.51	<0.02	<0.1	0.03	0.12	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	11/09/2017	0089_MW282_S_170911	Normal	175533	4.7	6.8	57	15	60	<0.02	1.4	0.78	10	1.0	***13***	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW282	16/10/2017	0089_MW282_S_171016	Normal	177956	6.0	5.9	58	5.7	75	<0.02	1.3	3.5	14	2.3	***12***	0.020	<0.02	<0.02	<0.1	<0.1	<0.5
	MW282	17/11/2017	0089_MW282_S_171117	Normal	203443	5.3	6.0	57	5.4	80	<0.02	1.3	3.1	15	2.5	*10*	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5
	MW282	5/12/2017	0089_MW282_S_171205	Normal	204183	8.0	7.4	44	4.3	100	<0.04	1.6	1.7	16	1.3	*7.6*	<0.02	<0.04	<0.04	<0.1	<0.2	<1
	MW282	15/01/2018	0089_MW282_S_180115	Normal	205568	4.9	7.6	50	4.7	66	<0.002	1.5	2.1	17	2.5	*7.2*	0.024	<0.002	<0.002	<0.005	<0.01	<0.05
	MW282	19/12/2019	0089_MW282_191219	Normal	EP1913595	7.28	11.7	59.8	6.15	183	<0.02	1.1	2.85	11.8	3.34	*7.70*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	19/12/2019	0089_QC101_191219	Field Duplicate	EP1913595	6.06	10.3	50.3	5.40	120	<0.02	0.6	2.81	19.7	3.29	*6.92*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	31/03/2020	0089_MW282_200331	Normal	EP2003366	5.69	9.88	68.8	6.36	54.2	<0.02	2.2	4.66	21.8	4.43	*8.84*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Helicopter Support Facility	MW282	22/07/2020	0089_MW282_200722	Normal	EP2007667	0.67	3.44	43.7	9.06	71.5	<0.02	0.2	0.55	3.83	0.99	***10.1***	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	24/09/2020	0089_MW282_200924	Normal	EP2010273	0.99	2.61	19.8	6.14	38.8	<0.02	0.4	0.97	5.56	0.72	*6.69*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	15/12/2020	0089_MW282_201215	Normal	EP2014041	3.29	7.16	41.2	4.76	44.1	<0.02	1.1	1.94	11.7	2.08	*5.77*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	18/03/2021	0089_MW282_210318	Normal	EP2102955	2.77	4.76	45.8	5.61	48.2	<0.02	1.3	2.05	12.6	2.17	*7.28*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	9/06/2021	0089_MW282_210609	Normal	EP2106514	4.89	7.83	42.7	3.15	40.3	<0.02	1.4	2.75	16.9	2.94	*4.50*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	31/08/2021	0089_MW282_210831	Normal	EP2110064	1.68	3.51	34.0	3.93	45.1	<0.02	0.6	1.05	7.00	1.48	*9.37*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	13/01/2022	0089_MW282_220113	Normal	EP2200339	1.00	2.81	51.5	20.7	91.7	<0.02	0.4	0.66	4.98	1.10	***13.1***	0.07	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	17/03/2022	0089_MW282_220317	Normal	EP2203138	3.02	6.09	63.0	9.56	76.9	<0.02	1.0	1.83	12.6	2.81	***12.0***	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	8/06/2022	0089_MW282_220608	Normal	EP2206971	1.30	3.44	23.7	4.29	71.3	<0.02	0.6	1.11	3.72	1.44	*4.10*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05
	MW282	8/09/2022	0089_MW282_220908	Normal	EP2211535	0.13	0.28	17.0	10.2	103	<0.02	<0.1	0.15	0.92	0.47	*9.32*	0.05	<0.02	<0.02	<0.02	<0.02	<0.05
	MW288	18/09/2017	0089_MW288_S_170918	Normal	176030	0.26	0.26	0.97	0.076	8.7	<0.002	0.052	0.044	0.21	0.045	0.097	0.024	0.005	<0.002	<0.005	<0.01	<0.05
	MW288	17/10/2017	0089_MW288_S_171017	Normal	177985	0.29	0.17	0.81	0.10	9.1	<0.002	0.059	0.082	0.30	0.042	0.090	0.025	0.006	<0.002	<0.005	<0.01	<0.05
	MW288	15/11/2017	0089_MW288_S_171115	Normal	203378	0.13	0.14	1.3	0.11	7.5	<0.002	0.039	0.034	0.20	0.058	0.10	0.024	0.005	<0.002	<0.005	<0.01	<0.05
	MW288	7/12/2017	0089_MW288_S_171207	Normal	204323	0.24	0.22	1.1	0.11	9.2	<0.002	0.046	0.037	0.20	0.039	0.11	0.022	0.004	<0.002	<0.005	<0.01	<0.05
	MW288	15/01/2018	0089_MW288_S_180115	Normal	205568	0.23	0.20	0.86	0.084	7.7	<0.002	0.052	0.042	0.22	0.040	0.080	0.023	0.005	<0.002	<0.005	<0.01	<0.05
Accommodation area	MW288	15/07/2020	0089_MW288_200715	Normal	EP2007385	0.22	0.21	1.09	0.08	12.0	<0.02	<0.1	0.07	0.32	0.07	0.12	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW288	17/03/2021	0089_MW288_210317	Normal	EP2102900	0.44	0.28	0.74	0.04	5.85	<0.02	<0.1	0.11	0.52	0.03	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW288	31/08/2021	0089_MW288_210831	Normal	EP2110071	0.16	0.24	0.57	0.03	5.30	<0.02	<0.1	0.04	0.26	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW288	12/01/2022	0089_MW288_220112	Normal	EP2200288	0.02	0.03	0.12	<0.02	4.50	<0.02	<0.1	<0.02	0.07	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW288	18/03/2022	0089_MW288_220318	Normal	EP2203194	<0.02	<0.02	0.05	<0.02	3.18	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW288	8/06/2022	0089_MW288_220608	Normal	EP2206971	<0.02	<0.02	0.05	<0.02	2.98	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW288	6/09/2022	0089_MW288_220906	Normal	EP2211390	<0.02	<0.02	0.02	<0.02	4.63	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	18/09/2017	0089_MW289_S_170918	Normal	176030	0.003	0.006	0.25	0.01	1.7	<0.002	0.002	0.003	0.010	0.005	0.011	0.005	<0.002	<0.002	<0.005	<0.01	<0.05
	MW289	17/10/2017	0089_MW289_S_171017	Normal	177985	0.005	0.012	0.29	0.023	2.0	<0.002	0.003	<0.002	0.013	0.004	0.016	0.007	<0.002	<0.002	<0.005	<0.01	<0.05
	MW289	15/11/2017	0089_MW289_S_171115	Normal	203378	0.004	0.007	0.20	0.011	1.5	<0.002	0.003	<0.002	0.008	0.004	0.008	0.005	<0.002	<0.002	<0.005	<0.01	<0.05
	MW289	7/12/2017	0089_MW289_S_171207	Normal	204323	0.006	0.010	0.17	0.01	1.6	<0.002	0.004	<0.002	0.008	0.002	0.009	0.004	<0.002	<0.002	<0.005	<0.01	<0.05
	MW289	15/01/2018	0089_MW289_S_180115	Normal	205568	0.004	0.011	0.18	0.016	1.4	<0.002	<0.002	<0.002	0.005	0.002	0.006	0.003	<0.002	<0.002	<0.005	<0.01	<0.05
	MW289	30/03/2020	0089_MW289_200330	Normal	EP2003313	<0.02	<0.02	0.09	<0.02	0.53	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	22/07/2020	0089_MW289_200722	Normal	EP2007667	0.03	0.02	0.17	<0.02	0.84	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	21/09/2020	0089_MW289_200921	Normal	EP2010077	0.12	0.12	0.71	0.05	2.37	<0.02	<0.1	<0.02	0.11	0.03	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	21/09/2020	0089_QC101_200921	Field Duplicate	EP2010077	0.12	0.12	0.73	0.04	1.59	<0.02	<0.1	<0.02	0.10	0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Accommodation area	MW289	21/09/2020	0089_QC201_200921	Interlab Duplicate	746269	0.06	0.06	0.52	0.02	1.6	<0.01	<0.05	0.02	0.06	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW289	15/12/2020	0089_MW289_201215	Normal	EP2014042	0.04	0.05	0.30	0.03	1.42	<0.02	<0.1	<0.02	0.03	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	16/03/2021	0089_MW289_210316	Normal	EP2102837	<0.02	<0.02	0.17	<0.02	0.80	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	9/06/2021	0089_MW289_210609	Normal	EP2106516	0.10	0.09	0.51	0.03	2.01	<0.02	<0.1	<0.02	0.07	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	30/08/2021	0089_MW289_210830	Normal	EP2110016	0.04	0.04	0.25	<0.02	0.76	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	30/08/2021	0089_QC103_210830	Field Duplicate	EP2110016	0.04	0.04	0.24	<0.02	0.76	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	30/08/2021	0089_QC203_210830	Interlab Duplicate	820919	0.02	0.03	0.19	0.02	0.65	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	MW289	13/01/2022	0089_MW289_220113	Normal	EP2200340	0.12	0.09	0.88	0.03	0.59	<0.02	<0.1	0.04	0.17	0.03	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	17/03/2022	0089_MW289_220317	Normal	EP2203138	0.11	0.08	0.49	0.02	0.36	<0.02	<0.1	0.06	0.20	0.04	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	8/06/2022	0089_MW289_220608	Normal	EP2206969	0.11	0.13	0.74	0.02	0.34	<0.02	<0.1	0.09	0.25	0.05	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW289	5/09/2022	0089_MW289_220905	Normal	EP2211345	0.07	0.07	0.59	0.03	1.61	<0.02	<0.1	0.04	0.08	0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW500	10/01/2022	0089_MW500_220110	Normal	EP2200214	0.17	0.57	13.6	5.59	45.1	<0.02	<0.1	0.13	1.30	0.23	*1.76*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW500	10/01/2022	0089_QC105_220110	Field Duplicate	EP2200214	0.16	0.48	12.0	4.96	45.8	<0.02	<0.1	0.13	1.25	0.21	*1.60*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
Fire Training Area	MW500	10/01/2022	0089_QC205_220110	Interlab Duplicate	854607	0.05	0.17	8.9	5.8	42	<0.01	<0.05	0.06	0.34	0.09	*1.4*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW500	14/03/2022	0089_MW500_220314	Normal	EP2202975	0.26	0.63	11.4	2.91	45.3	<0.02	0.2	0.43	3.23	0.37	*1.40*	0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW500	7/06/2022	0089_MW500_220607	Normal	EP2206880	0.84	2.01	24.2	2.00	49.3	<0.02	0.3	0.83	4.85	0.64	*1.83*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05
	MW500	5/09/2022	0089_MW500_220905	Normal	EP2211343	0.32	0.70	13.3	2.27	57.8	<0.02	0.2	0.30	1.92	0.31	*1.22*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.0001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water											*0.56*						
PFAS NEMP 2020 Interim Marine 99%					0.00023*						19						
PFAS NEMP 2020 Recreational Water											**10**						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																
AVCAT Storage	MW516	30/03/2020	0089_MW247_200330	Normal	EP2003313	0.09	0.16	2.21	0.25	12.3	<0.02	<0.1	0.16	0.23	0.05	0.20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	21/07/2020	0089_MW247_200721	Normal	EP2007611	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	21/09/2020	0089_MW516_200921	Normal	EP2010077	0.14	0.19	2.53	0.25	11.3	<0.02	<0.1	<0.02	0.25	0.04	0.13	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	16/12/2020	0089_MW516_201216	Normal	EP2014087	0.08	0.09	1.38	0.12	5.15	<0.02	<0.1	<0.02	0.16	0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	18/03/2021	0089_MW516_210318	Normal	EP2102954	0.08	0.08	1.61	0.15	11.0	<0.02	1.1	0.03	0.24	0.04	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	9/06/2021	0089_MW516_210609	Normal	EP2106515	0.16	0.11	1.40	0.12	9.21	<0.02	<0.1	<0.02	0.15	0.03	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	31/08/2021	0089_MW516_210831	Normal	EP2110073	0.15	0.12	1.42	0.09	4.80	<0.02	<0.1	<0.02	0.06	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	12/01/2022	0089_MW516_220112	Normal	EP2200288	0.09	0.05	1.18	0.08	9.40	<0.02	<0.1	<0.02	0.14	0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	17/03/2022	0089_MW516_220317	Normal	EP2203138	0.10	0.04	0.84	0.11	8.54	<0.02	<0.1	0.11	0.11	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	8/06/2022	0089_MW516_220608	Normal	EP2206969	0.06	0.05	0.90	0.12	10.4	<0.02	<0.1	<0.02	0.11	0.02	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
	MW516	6/09/2022	0089_MW516_220906	Normal	EP2211389	0.25	0.29	1.89	0.14	4.32	<0.02	<0.1	<0.02	0.23	0.03	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Fire Training Area	MW109	8/03/2017	0089_MW109_S_170803	Normal	199045	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW109	20/09/2017	0089_MW109_D_170920	Normal	176250	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW109	20/09/2017	0089_MW109_S_170920	Normal	176250	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW109	18/10/2017	0089_MW109_D_171018	Normal	178113	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW109	18/10/2017	0089_MW109_S_171018	Normal	178113	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW109	16/11/2017	0089_MW109_D_171116	Normal	203411	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW109	16/11/2017	0089_MW109_S_171116	Normal	203411	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW109	6/12/2017	0089_MW109_D_171206	Normal	204243	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW109	6/12/2017	0089_MW109_S_171206	Normal	204243	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW109	18/01/2018	0089_MW109_D_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW109	18/01/2018	0089_MW109_S_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW109	16/12/2019	0089_MW109_191216	Normal	EP1913380	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***19.5***	22.8	24.3
	MW109	30/03/2020	0089_MW109_200330	Normal	EP2003333	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***11.4***	13.1	13.8
	MW109	15/07/2020	0089_MW109_200715	Normal	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***14.1***	16.0	17.2
	MW109	15/07/2020	0089_QC105_200715	Field Duplicate	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***17.3***	19.4	20.9
	MW109	15/07/2020	0089_QC205_200215	Interlab Duplicate	732844	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***11.1***	12.56	13.12
	MW109	21/09/2020	0089_MW109_200921	Normal	EP2010093	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***21.3***	23.9	25.6
	MW109	14/12/2020	0089_MW109_201214	Normal	EP2013984	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***18.3***	20.7	22.1
	MW109	14/12/2020	0089_QC108_201214	Field Duplicate	EP2013984	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***18.8***	21.4	23.0
	MW109	14/12/2020	0089_QC208_201114	Interlab Duplicate	765054	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***20***	22.4	23.4
	MW109	16/03/2021	0089_MW109_210316	Normal	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.36***	8.66	9.46
	MW109	8/06/2021	0089_MW109_210608	Normal	EP2106448	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***53.2***	59.4	62.4
	MW109	30/08/2021	0089_MW109_210830	Normal	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.87***	5.77	6.23
	MW109	14/03/2022	0089_MW109_220314	Normal	EP2202975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.3***	12.7	13.8
	MW109	14/03/2022	0089_QC106_220314	Field Duplicate	EP2202975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.65***	10.9	11.6
	MW109	14/03/2022	0089_QC206_220314	Interlab Duplicate	872911	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***8.6***	10.26	10.95
	MW109	7/06/2022	0089_MW109_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.8***	12.3	13.2
	MW109	7/06/2022	0089_QC107_220607	Field Duplicate	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.2***	11.6	12.5
	MW109	7/06/2022	0089_QC207_220607	Interlab Duplicate	896805	<0.008	0.010	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	***6.3***	7.6	8.2
	MW109	5/09/2022	0089_MW109_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.61***	0.77	0.91
	MW109	5/09/2022	0089_QC117_220905	Field Duplicate	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***0.62***	0.78	0.92
	MW109	5/09/2022	0089_QC217_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***0.39***	0.51	0.62
Fire Training Area	MW112	30/10/2010	DS3-MB01	Normal	EP1005976														
	MW112	22/10/2013	WA0001_D53_MB01	Normal	EP1308039		0.1												
	MW112	26/05/2015	D53_MB01	Normal	EP1510572		<0.1	<0.1											
	MW112	29/09/2015	WA0001_MB01	Normal	EP1514335		<0.1	<0.1											
	MW112	23/02/2016	D53_MB01	Normal	EP1601568		<0.1	<0.1											
	MW112	25/10/2016	D53_MB01	Normal	521581		0.2												
	MW112	25/10/2016	QC102	Field Duplicate	521581		0.2												
	MW112	25/10/2016	QC202	Interlab Duplicate	521581		0.11												
	MW112	8/03/2017	0089_MW112_S_170803	Normal	199045	<0.001	0.073	0.004	<0.001	0.48	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW112	20/09/2017	0089_MW112_S_170920	Normal	176250	<0.001	0.087	0.003	<0.001	0.49	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW112	18/10/2017	0089_MW112_S_171018	Normal	178113	<0.01	0.11	0.010	<0.01	0.42	0.02	<0.02	<0.05	<0.1	0.022	<0.5			
	MW112	16/11/2017	0089_MW112_S_171116	Normal	203411	<0.01	0.054	<0.01	<0.01	0.48	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW112	6/12/2017	0089_MW112_S_171206	Normal	204243	<0.01	0.054	<0.01	<0.01	0.36	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW112	18/01/2018	0089_MW112_S_180118	Normal	205797	<0.001	0.064	<0.001	<0.001	0.57	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW112	8/01/2020	0089_MW112_200108	Normal	EP2000179	<0.05	0.13	<0.05	<0.05	0.26	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***24.5***	26.1	27.0
	MW112	30/03/2020	0089_MW112_200330	Normal	EP2003333	<0.05	0.17	<0.05	<0.05	0.58	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***71.0***	77.2	79.8
	MW112	30/03/2020	0089_QC102_200330	Field Duplicate	EP2003333	<0.05	0.16	<0.05	<0.05	0.54	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***71.0***	77.2	79.8
	MW112	30/03/2020	0089_QC202_200330	Interlab Duplicate	711144	<0.01	0.12	<0.01	<0.01	0.27	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***37.2***	40.39	41.75
	MW112	15/07/2020	0089_MW112_200715	Normal	EP2007385	<0.05	0.42	<0.05	<0.05	0.11	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***83.9***	97.9	111
	MW112	21/09/2020	0089_MW112_200921	Normal	EP2010093	<0.05	0.13	<0.05	<0.05	0.23	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***51.2***	59.4	65.9
	MW112	14/12/2020	0089_MW112_201214	Normal	EP2013984	<0.05	0.14	<0.05	<0.05	0.17	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***49.1***	57.2	61.7
	MW112	16/03/2021	0089_MW112_210316	Normal	EP2102833	<0.05	0.15	<0.05	<0.05	0.14	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***51.0***	60.6	67.2
	MW112	16/03/2021	0089_QC112_210316	Field Duplicate	EP2102833	<0.05	0.12	<0.05	<0.05	0.21	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***39.4***	46.5	50.8
	MW112	16/03/2021	0089_QC212_210316	Interlab Duplicate	781350	<0.01	0.09	<0.01	<0.01	0.21	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***41***	46.88	50.28
	MW112	8/06/2021	0089_MW112_210608	Normal	EP2106448	<0.05	0.19	<0.05	<0.05	0.25	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***57.2***	65.6	71.4
	MW112	30/08/2021	0089_MW112_210830	Normal	EP2110020	<0.05	0.05	<0.05	<0.05	0.47	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***39.3***	42.2	44.2
	MW112	10/01/2022	0089_MW112_220110	Normal	EP2200214	<0.05	<0.05	<0.05	<0.05	0.67	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***58.5***	63.2	65.1
	MW112	14/03/2022	0089_MW112_220314	Normal	EP2202975	<0.05	0.12	<0.05	<0.05	0.49	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***57.0***	61.6	65.2
	MW112	14/03/2022	0089_QC105_220314	Field Duplicate	EP2202975	<0.05	0.15	<0.05	<0.05	0.47	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***47.7***	52.1	55.4
	MW112	14/03/2022	0089_QC205_220314	Interlab Duplicate	872911	<0.01	0.14	<0.01	<0.01	0.33	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***59.7***	63.08	65.02
	MW112	7/06/2022	0089_MW112_220607	Normal	EP2206880	<0.05	0.10	<0.05	<0.05	0.71	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***81.2***	83.3	85.7
	MW112	7/06/2022	0089_QC105_220607	Field Duplicate	EP2206880	<0.05	0.09	<0.05	<0.05	0.74	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***88.8***	90.9	93.3
	MW112	7/06/2022	0089_QC205_220607	Interlab Duplicate	896805	<0.008	0.087	0.013	<0.004	0.46	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	***43***	45	47
	MW112	5/09/2022	0089_MW112_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	0.69	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***67.6***	70.3	72.2

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Fire Training Area	MW120	8/03/2017	0089_MW120_S_170803	Normal	199045	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW120	20/09/2017	0089_MW120_D_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW120	20/09/2017	0089_MW120_S_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW120	18/10/2017	0089_MW120_D_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW120	18/10/2017	0089_MW120_S_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW120	16/11/2017	0089_MW120_D_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW120	16/11/2017	0089_MW120_S_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW120	6/12/2017	0089_MW120_D_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW120	6/12/2017	0089_MW120_S_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW120	18/01/2018	0089_MW120_D_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW120	18/01/2018	0089_MW120_S_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW120	16/12/2019	0089_MW120_191216	Normal	EP1913380	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.98***	10.5	11.1
	MW120	30/03/2020	0089_MW120_200330	Normal	EP2003333	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***14.6***	15.4	16.2
	MW120	15/07/2020	0089_MW120_200715	Normal	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.75***	7.27	7.85
	MW120	15/07/2020	0089_QC106_200715	Field Duplicate	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.39***	8.91	9.51
	MW120	15/07/2020	0089_QC206_200215	nterlab Duplicate	732844	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***6.6***	6.98	7.38
	MW120	14/12/2020	0089_MW120_201214	Normal	EP2013984	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.52***	5.84	6.16
	MW120	16/03/2021	0089_MW120_210316	Normal	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.14***	7.55	8.06
	MW120	8/06/2021	0089_MW120_210608	Normal	EP2106448	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.13***	6.51	7.01
	MW120	30/08/2021	0089_MW120_210830	Normal	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***17.0***	18.8	21.1
	MW120	10/01/2022	0089_MW120_220110	Normal	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.8***	16.1	20.4
	MW120	10/01/2022	0089_QC104_220110	Field Duplicate	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***14.6***	16.9	20.7
	MW120	10/01/2022	0089_QC204_220110	nterlab Duplicate	854607	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***9.09***	10.82	13.36
	MW120	14/03/2022	0089_MW120_220314	Normal	EP2202975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.15***	9.89	12.4
	MW120	14/03/2022	0089_QC104_220314	Field Duplicate	EP2202975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.37***	11.1	13.7
	MW120	14/03/2022	0089_QC204_220314	nterlab Duplicate	872911	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***6.5***	7.02	7.69
	MW120	7/06/2022	0089_MW120_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.16***	5.70	6.49
	MW120	5/09/2022	0089_MW120_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***22.6***	24.7	28.4
	MW120	5/09/2022	0089_QC116_220905	Field Duplicate	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***21.8***	24.0	27.6
	MW120	5/09/2022	0089_QC216_220905	nterlab Duplicate	920981	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***17.28***	18.79	21
Fire Training Area	MW121	23/02/2016	D53_MB03A	Normal	EP1601568		<0.1	<0.1											
	MW121	25/10/2016	D53_MB03A	Normal	521581		<0.05												
	MW121	8/03/2017	0089_MW121_S_170803	Normal	199045	<0.001	0.043	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW121	20/09/2017	0089_MW121_D_170920	Normal	176250	<0.001	0.010	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW121	20/09/2017	0089_MW121_S_170920	Normal	176250	<0.001	0.010	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW121	18/10/2017	0089_MW121_D_171018	Normal	178113	<0.001	0.011	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW121	18/10/2017	0089_MW121_S_171018	Normal	178113	<0.001	0.008	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW121	16/11/2017	0089_MW121_D_171116	Normal	203411	<0.001	0.002	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW121	16/11/2017	0089_MW121_S_171116	Normal	203411	<0.001	0.001	<0.001	<0.001	<0.01	<0.05	<0.002	0.008	<0.1	<0.002	<0.05			
	MW121	6/12/2017	0089_MW121_D_171206	Normal	204243	<0.001	0.006	0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW121	6/12/2017	0089_MW121_S_171206	Normal	204243	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW121	18/01/2018	0089_MW121_D_180118	Normal	205797	<0.001	0.040	0.004	<0.001	0.02	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW121	18/01/2018	0089_MW121_S_180118	Normal	205797	<0.001	0.033	0.004	<0.001	0.02	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW121	16/12/2019	0089_MW121_191216	Normal	EP1913380	<0.05	0.10	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.11***	7.09	7.33
	MW121	30/03/2020	0089_MW121_200330	Normal	EP2003333	<0.05	0.17	0.05	<0.05	0.42	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***62.8***	67.7	70.6
	MW121	15/07/2020	0089_MW121_200715	Normal	EP2007385	<0.05	0.10	<0.05	<0.05	0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***40.4***	43.4	44.9
	MW121	21/09/2020	0089_MW121_200921	Normal	EP2010093	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.09***	7.67	7.89
	MW121	14/12/2020	0089_MW121_201214	Normal	EP2013992	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.12***	8.74	8.94
	MW121	16/03/2021	0089_MW121_210316	Normal	EP2102833	<0.05	0.14	<0.05	<0.05	0.32	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***47.0***	52.0	56.2
	MW121	8/06/2021	0089_MW121_210608	Normal	EP2106448	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.4***	15.3	16.0
	MW121	30/08/2021	0089_MW121_210830	Normal	EP2110020	<0.05	<0.05	<0.05	<0.05	0.43	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***87.9***	91.3	93.3
	MW121	10/01/2022	0089_MW121_220110	Normal	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.33*	0.39	0.39
	MW121	14/03/2022	0089_MW121_220314	Normal	EP2202975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.49*	0.57	0.60
	MW121	14/03/2022	0089_QC102_220314	Field Duplicate	EP2202975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.59*	0.69	0.72
	MW121	14/03/2022	0089_QC202_220314	nterlab Duplicate	872911	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.03	<0.05	<0.1
	MW121	7/06/2022	0089_MW121_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.89***	6.81	7.19
	MW121	7/06/2022	0089_QC101_220607	Field Duplicate	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.12***	7.02	7.45
	MW121	7/06/2022	0089_QC201_220607	nterlab Duplicate	896805	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	***4.9***	5.7	6.0
	MW121	5/09/2022	0089_MW121_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.19*	0.23	0.23
Fire Training Area	MW123	8/03/2017	0089_MW123_S_170803	Normal	199045	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW123	20/09/2017	0089_MW123_D_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW123	20/09/2017	0089_MW123_S_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW123	18/10/2017	0089_MW123_D_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW123	18/10/2017	0089_MW123_S_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW123	16/11/2017	0089_MW123_D_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW123	16/11/2017	0089_MW123_S_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW123	6/12/2017	0089_MW123_D_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW123	6/12/2017	0089_MW123_S_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW123	18/01/2018	0089_MW123_D_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW123	18/01/2018	0089_MW123_S_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW123	16/12/2019	0089_MW123_191216	Normal	EP1913380	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.31*	1.88	1.99
	MW123	16/12/2019	0089_QC101_191216	Field Duplicate	EP1913380	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.31*	1.84	1.94
	MW123	16/12/2019	0089_QC201_191216	nterlab Duplicate	694635	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.88*	1.22	1.29
	MW123	18/12/2019	0089_QC201_191218	nterlab Duplicate	695528	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.09*	0.09	0.1
	MW123	14/12/2020	0089_MW123_201214	Normal	EP2013992	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.21*	0.67	0.72
	MW123	16/03/2021	0089_MW123_210316	Normal	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.53*	1.27	1.35
	MW123	16/03/2021	0089_QC108_210316	Field Duplicate	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.55*	1.30	1.39
	MW123	16/03/2021	0089_QC208_210316	nterlab Duplicate	781350	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.47*	1.14	1.25
	MW123	8/06/2021	0089_MW123_210608	Normal	EP2106448	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.75*	1.69	1.82
	MW123	8/06/2021	0089_QC102_210608	Field Duplicate	EP2106448	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.65*	1.48	1.62
	MW123	8/06/2021	0089_QC202_210608	nterlab Duplicate	802464	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.64*	1.47	1.66
	MW123	30/08/2021	0089_MW123_210830	Normal	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.27*	0.65	0.73
	MW123	10/01/2022	0089_MW123_220110	Normal	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.35*	0.94	1.03
	MW123	10/01/2022	0089_QC101_220110	Field Duplicate	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.32*	0.90	0.98

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	MW123	10/01/2022	0089_QC201_220110	Interlab Duplicate	854607	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.2*	0.53	0.64
	MW123	14/03/2022	0089_MW123_220314	Normal	EP2202975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.76*	2.22	2.44
	MW123	7/06/2022	0089_MW123_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.62*	1.43	1.61
	MW123	5/09/2022	0089_MW123_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.28*	0.61	0.71
	MW123	5/09/2022	0089_QC114_220905	Field Duplicate	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.45*	0.90	1.03
	MW123	5/09/2022	0089_QC214_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.21*	0.41	0.49
	MW124	8/03/2017	0089_MW124_S_170803	Normal	199045	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW124	20/09/2017	0089_MW124_D_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW124	20/09/2017	0089_MW124_S_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW124	18/10/2017	0089_MW124_D_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW124	18/10/2017	0089_MW124_S_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW124	16/11/2017	0089_MW124_D_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW124	16/11/2017	0089_MW124_S_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW124	6/12/2017	0089_MW124_D_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW124	6/12/2017	0089_MW124_S_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW124	18/01/2018	0089_MW124_D_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW124	18/01/2018	0089_MW124_S_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
Fire Training Area	MW124	9/01/2020	0089_MW124_200109	Normal	EP2000249	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	9/01/2020	0089_QC101_200109	Field Duplicate	EP2000249	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	9/01/2020	0089_QC201_200109	Interlab Duplicate	696324	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW124	30/03/2020	0089_MW124_200330	Normal	EP2003333	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	15/07/2020	0089_MW124_200715	Normal	EP2007382	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	22/09/2020	0089_MW124_200922	Normal	EP2010151	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	MW124	14/12/2020	0089_MW124_201214	Normal	EP2013984	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	15/03/2021	0089_MW124_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	8/06/2021	0089_MW124_210608	Normal	EP2106448	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.74*	2.43	2.72
	MW124	30/08/2021	0089_MW124_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	10/01/2022	0089_MW124_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	14/03/2022	0089_MW124_220314	Normal	EP2202976	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	MW124	7/06/2022	0089_MW124_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	5/09/2022	0089_MW124_220905	Normal	EP2211345	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	5/09/2022	0089_QC102_220905	Field Duplicate	EP2211345	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW124	5/09/2022	0089_QC202_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
	MW125	8/03/2017	0089_MW125_S_170803	Normal	199045	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW125	20/09/2017	0089_MW125_D_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW125	20/09/2017	0089_MW125_S_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW125	18/10/2017	0089_MW125_D_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW125	18/10/2017	0089_MW125_S_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW125	18/10/2017	0089_QC1MW_171018	Field Duplicate	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW125	18/10/2017	0089_QC2MW_171018	Interlab Duplicate	568770	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.27*	0.35	0.4
	MW125	16/11/2017	0089_MW125_D_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW125	16/11/2017	0089_MW125_S_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW125	6/12/2017	0089_MW125_D_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW125	6/12/2017	0089_MW125_S_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW125	18/01/2018	0089_MW125_D_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW125	18/01/2018	0089_MW125_S_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW125	18/01/2018	0089_QC1MW_180118	Field Duplicate	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW125	18/01/2018	0089_QC2MW_180118	Interlab Duplicate	581139	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.15*	0.21	0.26
Fire Training Area	MW125	18/01/2018	0089_QC2MW_180118	Interlab Duplicate	581139	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
	MW125	9/01/2020	0089_MW125_200109	Normal	EP2000249	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.66*	0.88	1.03
	MW125	30/03/2020	0089_MW125_200330	Normal	EP2003333	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.44*	0.59	0.66
	MW125	15/07/2020	0089_MW125_200715	Normal	EP2007382	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	MW125	22/09/2020	0089_MW125_200922	Normal	EP2010151	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.25*	0.34	0.40
	MW125	14/12/2020	0089_MW125_201214	Normal	EP2013984	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.38*	0.55	0.63
	MW125	15/03/2021	0089_MW125_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.43*	0.70	0.82
	MW125	8/06/2021	0089_MW125_210608	Normal	EP2106448	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
	MW125	30/08/2021	0089_MW125_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.28*	0.39	0.46
	MW125	30/08/2021	0089_QC101_210830	Field Duplicate	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.28*	0.39	0.46
	MW125	30/08/2021	0089_QC201_210830	Interlab Duplicate	820919	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.27*	0.36	0.43
	MW125	10/01/2022	0089_MW125_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.63*	1.05	1.22
	MW125	14/03/2022	0089_MW125_220314	Normal	EP2202976	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.72*	1.14	1.32
	MW125	14/03/2022	0089_QC103_220314	Field Duplicate	EP2202976	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.79*	1.22	1.41
	MW125	14/03/2022	0089_QC203_220314	Interlab Duplicate	872911	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.66*	0.98	1.17
	MW125	7/06/2022	0089_MW125_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.98*	1.45	1.69
	MW125	5/09/2022	0089_MW125_220905	Normal	EP2211345	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.50*	0.80	0.92
	MW126	8/03/2017	0089_MW126_S_170803	Normal	199045	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW126	20/09/2017	0089_MW126_D_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW126	20/09/2017	0089_MW126_S_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW126	18/10/2017	0089_MW126_D_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW126	18/10/2017	0089_MW126_S_171018	Normal	178113	<0.001	0.002	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW126	16/11/2017	0089_MW126_D_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW126	16/11/2017	0089_MW126_S_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW126	6/12/2017	0089_MW126_D_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW126	6/12/2017	0089_MW126_S_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW126	18/01/2018	0089_MW126_D_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW126	18/01/2018	0089_MW126_S_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
Fire Training Area	MW126	8/01/2020	0089_MW126_200108	Normal	EP2000179	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW126	31/03/2020	0089_MW126_200331	Normal	EP2003364	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW126	15/07/2020	0089_MW126_200715	Normal	EP2007382	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW126	22/09/2020	0089_MW126_200922	Normal	EP2010151	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
	MW126	14/12/2020	0089_MW126_201214	Normal	EP2013984	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW126	15/03/2021	0089_MW126_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW126	8/06/2021	0089_MW126_210608	Normal	EP2106448	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.32*	0.55	0.65
	MW126	30/08/2021	0089_MW126_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	MW126	10/01/2022	0089_MW126_220110	Normal	EP2200211	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW126	14/03/2022	0089_MW126_220314	Normal	EP2202976	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW126	7/06/2022	0089_MW126_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW126	5/09/2022	0089_MW126_220905	Normal	EP2211345	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Fire Training Area	MW127	8/03/2017	0089_MW127_S_170803	Normal	199045	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW127	8/03/2017	0089_QC1MW_S_170803	Field Duplicate	199045	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW127	4/08/2017	0089_QC2MW_170803	Interlab Duplicate	557474	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW127	20/09/2017	0089_MW127_S_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW127	18/10/2017	0089_MW127_S_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW127	16/11/2017	0089_MW127_S_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW127	16/11/2017	0089_QC1MW_171116	Field Duplicate	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW127	16/11/2017	0089_QC2MW_171116	Interlab Duplicate	573296	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW127	6/12/2017	0089_MW127_S_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW127	18/01/2018	0089_MW127_S_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW127	8/01/2020	0089_MW127_200108	Normal	EP2000179	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	31/03/2020	0089_MW127_200331	Normal	EP2003364	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	31/03/2020	0089_QC104_200331	Field Duplicate	EP2003364	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	31/03/2020	0089_QC204_200331	Interlab Duplicate	711434	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW127	15/07/2020	0089_MW127_200715	Normal	EP2007382	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	22/09/2020	0089_MW127_200922	Normal	EP2010151	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	14/12/2020	0089_MW127_201214	Normal	EP2013984	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	15/03/2021	0089_MW127_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	8/06/2021	0089_MW127_210608	Normal	EP2106448	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	30/08/2021	0089_MW127_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	10/01/2022	0089_MW127_220110	Normal	EP2200211	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	14/03/2022	0089_MW127_220314	Normal	EP2202976	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	7/06/2022	0089_MW127_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	5/09/2022	0089_MW127_220905	Normal	EP2211345	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	5/09/2022	0089_QC113_220905	Field Duplicate	EP2211345	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW127	5/09/2022	0089_QC213_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Fire Training Area	MW128	8/03/2017	0089_MW128_S_170803	Normal	199045	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW128	20/09/2017	0089_MW128_D_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW128	20/09/2017	0089_MW128_S_170920	Normal	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW128	20/09/2017	0089_QC1MW_170920	Field Duplicate	176250	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW128	20/09/2017	0089_QC2MW_170920	Interlab Duplicate	564343	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW128	18/10/2017	0089_MW128_D_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW128	18/10/2017	0089_MW128_S_171018	Normal	178113	<0.001	<0.001	<0.001	<0.005	<0.01	<0.02	<0.002	<0.02	<0.05	<0.002	<0.2			
	MW128	16/11/2017	0089_MW128_D_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW128	16/11/2017	0089_MW128_S_171116	Normal	203411	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW128	6/12/2017	0089_MW128_D_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW128	6/12/2017	0089_MW128_S_171206	Normal	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW128	6/12/2017	0089_QC1MW_171206	Field Duplicate	204243	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW128	6/12/2017	0089_QC2MW_171206	Interlab Duplicate	576599	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***6.33***	6.38	6.52
	MW128	18/01/2018	0089_MW128_D_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW128	18/01/2018	0089_MW128_S_180118	Normal	205797	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW128	8/06/2022	0089_MW128_220608	Normal	EP2206971	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.54***	6.63	6.68
	MW128	5/09/2022	0089_MW128_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.79***	7.93	8.02
	MW139	30/10/2010	C24-MB01	Normal	EP1005976														
	MW139	18/10/2013	WA0006_C24_MB01	Normal	EP1307981		<0.1												
	MW139	26/05/2015	C24_MB01	Normal	EP1510572		<0.5	<0.5											
	MW139	29/09/2015	C24_MB01	Normal	EP1514335		<0.1	<0.1											
	MW139	25/10/2016	C24_MB01	Normal	521581		<0.05												
	MW139	1/08/2017	0089_MW139_S_170801	Normal	198918	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW139	19/09/2017	0089_MW139_D_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW139	19/09/2017	0089_MW139_S_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW139	17/10/2017	0089_MW139_D_171017	Normal	177985	<0.001	0.001	<0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW139	17/10/2017	0089_MW139_S_171017	Normal	177985	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Demolition Ground	MW139	20/11/2017	0089_MW139_D_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW139	20/11/2017	0089_MW139_S_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW139	4/12/2017	0089_MW139_D_171204	Normal	204124	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW139	4/12/2017	0089_MW139_S_171204	Normal	204124	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW139	17/01/2018	0089_MW139_D_1801117	Normal	205691	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW139	17/01/2018	0089_MW139_S_1801117	Normal	205691	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW139	1/02/2018	0089_MW139_D_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW139	1/02/2018	0089_MW139_I_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW139	1/02/2018	0089_MW139_S_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW139	1/02/2018	0089_QC6MW_180201	Field Duplicate	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW139	1/02/2018	0089_QC7MW_180201	Interlab Duplicate	582979	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW139	8/01/2020	0089_MW139_200108	Normal	EP2000179	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
	MW139	8/01/2020	0089_QC101_200108	Field Duplicate	EP2000179	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
	MW139	8/01/2020	0089_QC201_200108	Interlab Duplicate	696100	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
	MW139	30/03/2020	0089_MW139_200330	Normal	EP2003308	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW139	20/07/2020	0089_MW139_200720	Normal	EP2007544	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW139	22/09/2020	0089_MW139_200922	Normal	EP2010151	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	MW139	14/12/2020	0089_MW139_201214	Normal	EP2013983	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW139	16/03/2021	0089_MW139_210316	Normal	EP2102837	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW139	8/06/2021	0089_MW139_210608	Normal	EP2106464	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW139	8/06/2021	0089_QC101_210608	Field Duplicate	EP2106464	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.06	0.06
	MW139	8/06/2021	0089_QC201_210608	Interlab Duplicate	802464	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW139	31/08/2021	0089_MW139_210831	Normal	EP2110071	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW139	10/01/2022	0089_MW139_220110	Normal	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW139	15/03/2022	0089_MW139_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW139	8/06/2022	0089_MW139_220608	Normal	EP2206969	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW139	5/09/2022	0089_MW139_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Demolition Ground	MW141	30/10/2010	C24-MBO3	Normal	EP1005976														
	MW141	18/10/2013	WA0006_C24_MB03	Normal	EP1307981		<0.1												
	MW141	26/05/2015	C24_MB03	Normal	EP1510572		<0.5	<0.5											
	MW141	29/09/2015	C24_MB03	Normal	EP1514335		<0.5	<0.5											
	MW141	25/10/2016	C24_MB03	Normal	521581		<0.05												
	MW141	1/08/2017	0089_MW141_S_170801	Normal	198918	<0.001	0.059	0.004	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW141	19/09/2017	0089_MW141_D_170919	Normal	176140	<0.001	0.10	0.004	<0.001	0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW141	19/09/2017	0089_MW141_S_170919	Normal	176140	<0.001	0.10	0.002	<0.001	0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW141	19/09/2017	0089_QC1MW_170919	Field Duplicate	176140	<0.001	0.10	0.004	<0.001	0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW141	19/09/2017	0089_QC2MW_170919	Interlab Duplicate	564343	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***106***	137.82	142.42
	MW141	17/10/2017	0089_MW141_D_171017	Normal	177985	<0.010	0.031	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW141	17/10/2017	0089_MW141_S_171017	Normal	177985	<0.010	0.12	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW141	20/11/2017	0089_MW141_D_171120	Normal	203545	<0.05	0.26	<0.05	<0.05	<0.5	<0.2	<0.1	<0.2	<0.5	<0.1	<2.5			
	MW141	20/11/2017	0089_MW141_S_171120	Normal	203545	<0.05	0.19	<0.05	<0.05	<0.5	<0.2	<0.1	<0.2	<0.5	<0.1	<2.5			
	MW141	4/12/2017	0089_MW141_D_171204	Normal	204124	<0.02	0.060	<0.02	<0.020	<0.2	<0.1	<0.04	<0.1	<0.2	<0.04	<1			
	MW141	4/12/2017	0089_MW141_S_171204	Normal	204124	<0.02	0.17	<0.02	<0.02	<0.2	<0.1	<0.04	<0.1	<0.2	<0.04	<1			
	MW141	17/01/2018	0089_MW141_D_1801117	Normal	205691	<0.001	0.080	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW141	17/01/2018	0089_MW141_S_1801117	Normal	205691	<0.001	0.24	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW141	1/02/2018	0089_MW141_D_180201	Normal	206292	<0.01	0.20	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW141	1/02/2018	0089_MW141_I_180201	Normal	206292	<0.01	0.19	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW141	1/02/2018	0089_MW141_S_180201	Normal	206292	<0.01	0.29	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW141	8/01/2020	0089_MW141_200108	Normal	EP2000179	<0.05	0.12	<0.05	<0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***71.5***	90.7	93.0
	MW141	30/03/2020	0089_MW141_200330	Normal	EP2003308	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***64.3***	75.9	78.0
	MW141	20/07/2020	0089_MW141_200720	Normal	EP2007544	<0.05	0.06	<0.05	<0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***62.4***	79.7	82.5
	MW141	23/09/2020	0089_MW141_200923	Normal	EP2010220	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***78.1***	96.1	99.6
	MW141	14/12/2020	0089_MW141_201214	Normal	EP2013975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***50.1***	62.4	64.5
	MW141	16/03/2021	0089_MW141_210316	Normal	EP2102837	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***39.1***	47.3	49.1
	MW141	8/06/2021	0089_MW141_210608	Normal	EP2106464	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***45.7***	55.9	57.5
	MW141	31/08/2021	0089_MW141_210831	Normal	EP2110071	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***116***	138	143
	MW141	10/01/2022	0089_MW141_220110	Normal	EP2200214	<0.05	0.11	<0.05	<0.05	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***201***	236	243
	MW141	10/01/2022	0089_QC112_220110	Field Duplicate	EP2200214	<0.05	0.10	<0.05	<0.05	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***177***	213	218
	MW141	10/01/2022	0089_QC212_220110	Interlab Duplicate	854607	<0.01	0.08	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***187***	220.91	226.99
	MW141	15/03/2022	0089_MW141_220315	Normal	EP2203018	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***112***	138	142
	MW141	8/06/2022	0089_MW141_220608	Normal	EP2206969	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***53.6***	62.1	64.8
	MW141	5/09/2022	0089_MW141_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***131***	150	154
	MW141	5/09/2022	0089_QC101_220905	Field Duplicate	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***129***	148	151
	MW141	5/09/2022	0089_QC201_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***82***	90.58	92.98

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Demolition Ground	MW142	1/08/2017	0089_MW142_S_170801	Normal	198918	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW142	19/09/2017	0089_MW142_D_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW142	19/09/2017	0089_MW142_S_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW142	17/10/2017	0089_MW142_D_171017	Normal	177985	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW142	17/10/2017	0089_MW142_S_171017	Normal	177985	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW142	17/10/2017	0089_QC1MW_171017	Field Duplicate	177985	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW142	17/10/2017	0089_QC2MW_171017	Interlab Duplicate	568770	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***3.41***	3.93	3.98
	MW142	20/11/2017	0089_MW142_D_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW142	20/11/2017	0089_MW142_S_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW142	20/11/2017	0089_QC1MW_171120	Field Duplicate	203545	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW142	20/11/2017	0089_QC2MW_171120	Interlab Duplicate	573488	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***2.97***	3.58	3.67
	MW142	4/12/2017	0089_MW142_D_171204	Normal	204124	<0.001	<0.001	<0.001	<0.001	<0.01	<0.1	<0.002	<0.005	<0.2	<0.002	<0.05			
	MW142	4/12/2017	0089_MW142_S_171204	Normal	204124	<0.001	<0.001	<0.001	<0.001	<0.01	<0.1	<0.002	<0.005	<0.2	<0.002	<0.05			
	MW142	4/12/2017	0089_QC1MW_171204	Field Duplicate	204124	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW142	4/12/2017	0089_QC2MW_171204	Interlab Duplicate	576083	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***3.3***	4.34	4.41
	MW142	17/01/2018	0089_MW142_D_1801117	Normal	205691	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW142	17/01/2018	0089_MW142_S_1801117	Normal	205691	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW142	1/02/2018	0089_MW142_D_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW142	1/02/2018	0089_MW142_I_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW142	1/02/2018	0089_MW142_S_180201	Normal	206292	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW142	8/01/2020	0089_MW142_200108	Normal	EP2000179	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***24.3***	42.9	44.7
	MW142	30/03/2020	0089_MW142_200330	Normal	EP2003308	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***41.8***	69.5	71.5
	MW142	20/07/2020	0089_MW142_200720	Normal	EP2007544	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.10***	3.85	3.97
	MW142	23/09/2020	0089_MW142_200923	Normal	EP2010220	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.58***	7.02	7.23
	MW142	14/12/2020	0089_MW142_201214	Normal	EP2013975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.61***	7.32	7.54
	MW142	16/03/2021	0089_MW142_210316	Normal	EP2102837	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.83***	8.79	9.03
	MW142	8/06/2021	0089_MW142_210608	Normal	EP2106464	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.71***	9.39	9.72
	MW142	30/08/2021	0089_MW142_210830	Normal	EP2110016	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.66***	7.50	7.77
	MW142	10/01/2022	0089_MW142_220110	Normal	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.00***	7.17	7.36
	MW142	15/03/2022	0089_MW142_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.52***	6.15	6.30
	MW142	8/06/2022	0089_MW142_220608	Normal	EP2206969	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.87***	4.76	4.88
	MW142	5/09/2022	0089_MW142_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.41***	12.9	13.3
Demolition Ground	MW147	30/10/2010	C24-MB02	Normal	EP1005976														
	MW147	18/10/2013	QC37	Field Duplicate	EP1307981		<0.1												
	MW147	18/10/2013	WA0006_C24_MB02	Normal	EP1307981		<0.1												
	MW147	26/05/2015	C24_MB02	Normal	EP1510572		<0.5	<0.5											
	MW147	29/09/2015	C24_MB02	Normal	EP1514335		<0.5	<0.5											
	MW147	25/10/2016	C24_MB02	Normal	521581		<0.05												
	MW147	1/08/2017	0089_MW147_S_170801	Normal	198918	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW147	19/09/2017	0089_MW147_D_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW147	19/09/2017	0089_MW147_S_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW147	17/10/2017	0089_MW147_D_171017	Normal	177985	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW147	17/10/2017	0089_MW147_S_171017	Normal	177985	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW147	20/11/2017	0089_MW147_D_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW147	20/11/2017	0089_MW147_S_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW147	4/12/2017	0089_MW147_D_171204	Normal	204124	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW147	4/12/2017	0089_MW147_S_171204	Normal	204124	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW147	17/01/2018	0089_MW147_D_1801117	Normal	205691	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW147	17/01/2018	0089_MW147_S_1801117	Normal	205691	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW147	1/02/2018	0089_MW147_D_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW147	1/02/2018	0089_MW147_I_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW147	1/02/2018	0089_MW147_S_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW147	20/07/2020	0089_MW147_200720	Normal	EP2007544	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.24*	0.38	0.38

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Demolition Ground	MW149	1/08/2017	0089_MW149_S_170801	Normal	198918	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW149	19/09/2017	0089_MW149_D_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW149	19/09/2017	0089_MW149_S_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW149	17/10/2017	0089_MW149_D_171017	Normal	177985	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW149	17/10/2017	0089_MW149_S_171017	Normal	177985	<0.001	<0.001	<0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW149	20/11/2017	0089_MW149_D_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW149	20/11/2017	0089_MW149_S_171120	Normal	203545	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW149	4/12/2017	0089_MW149_D_171204	Normal	204124	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW149	4/12/2017	0089_MW149_S_171204	Normal	204124	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW149	17/01/2018	0089_MW149_D_1801117	Normal	205691	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW149	17/01/2018	0089_MW149_S_1801117	Normal	205691	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW149	17/01/2018	0089_QC1MW_S_1801117	Field Duplicate	205691	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW149	17/01/2018	0089_QC2MW_180117	nterlab Duplicate	580891	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW149	17/01/2018	0089_QC2MW_180117	nterlab Duplicate	580891	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			
	MW149	1/02/2018	0089_MW149_D_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW149	1/02/2018	0089_MW149_I_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW149	1/02/2018	0089_MW149_S_180201	Normal	206292	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW149	8/01/2020	0089_MW149_200108	Normal	EP2000179	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	30/03/2020	0089_MW149_200330	Normal	EP2003308	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	20/07/2020	0089_MW149_200720	Normal	EP2007544	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	23/09/2020	0089_MW149_200923	Normal	EP2010217	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	14/12/2020	0089_MW149_201214	Normal	EP2013983	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	16/03/2021	0089_MW149_210316	Normal	EP2102836	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	8/06/2021	0089_MW149_210608	Normal	EP2106464	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	8/06/2021	0089_QC105_210608	Field Duplicate	EP2106464	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	8/06/2021	0089_QC205_210608	nterlab Duplicate	802464	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW149	30/08/2021	0089_MW149_210830	Normal	EP2110016	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	10/01/2022	0089_MW149_220110	Normal	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06
	MW149	15/03/2022	0089_MW149_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	8/06/2022	0089_MW149_220608	Normal	EP2206969	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW149	5/09/2022	0089_MW149_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Waste Water Treatment Plant	MW158	7/08/2017	0089_MW158_S_170807	Normal	199149	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW158	8/01/2020	0089_MW158_200108	Normal	EP2000182	<0.05	0.15	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.17	0.17
	MW158	31/03/2020	0089_MW158_200331	Normal	EP2003364	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	21/07/2020	0089_MW158_200721	Normal	EP2007594	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	21/09/2020	0089_MW158_200921	Normal	EP2010093	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	14/12/2020	0089_MW158_201214	Normal	EP2013984	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	15/03/2021	0089_MW158_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	10/06/2021	0089_MW158_210610	Normal	EP2106588	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	30/08/2021	0089_MW158_210830	Normal	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	30/08/2021	0089_QC110_210830	Field Duplicate	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	30/08/2021	0089_QC210_210830	nterlab Duplicate	820919	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW158	15/03/2022	0089_MW158_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	7/06/2022	0089_MW158_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW158	5/09/2022	0089_MW158_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Waste Water Treatment Plant	MW161	7/08/2017	0089_MW161_S_170807	Normal	199149	<0.001	0.015	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW161	18/09/2017	0089_MW161_S_170918	Normal	176030	<0.001	0.011	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW161	19/10/2017	0089_MW161_S_171019	Normal	178275	<0.001	0.015	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW161	15/11/2017	0089_MW161_S_171115	Normal	203378	<0.001	0.024	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW161	7/12/2017	0089_MW161_S_171207	Normal	204323	<0.001	0.018	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW161	16/01/2018	0089_MW161_S_180116	Normal	205631	<0.001	0.017	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW161	8/01/2020	0089_MW161_200108	Normal	EP2000182	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***16.8***	18.0	18.2
	MW161	1/04/2020	0089_MW161_200401	Normal	EP2003417	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.2***	14.3	14.7
	MW161	21/07/2020	0089_MW161_200721	Normal	EP2007594	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.0***	14.3	14.8
	MW161	21/09/2020	0089_MW161_200921	Normal	EP2010093	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.3***	13.2	13.5
	MW161	14/12/2020	0089_MW161_201214	Normal	EP2013992	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.21***	8.77	8.97
	MW161	15/03/2021	0089_MW161_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.97***	8.54	8.72
	MW161	10/06/2021	0089_MW161_210610	Normal	EP2106588	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.80***	7.50	7.68
	MW161	30/08/2021	0089_MW161_210830	Normal	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.59***	6.15	6.25
	MW161	10/01/2022	0089_MW161_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.34***	7.11	7.33
	MW161	15/03/2022	0089_MW161_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.43***	5.02	5.11
	MW161	7/06/2022	0089_MW161_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.05***	5.66	5.83
	MW161	5/09/2022	0089_MW161_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.25***	3.46	3.49

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Waste Water Treatment Plant	MW166	7/08/2017	0089_MW166_S_170807	Normal	199149	<0.001	0.021	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW166	18/09/2017	0089_MW166_S_170918	Normal	176030	<0.001	0.013	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW166	19/10/2017	0089_MW166_S_171019	Normal	178275	<0.001	0.016	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW166	15/11/2017	0089_MW166_S_171115	Normal	203378	<0.001	0.012	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW166	7/12/2017	0089_MW166_S_171207	Normal	204323	<0.001	0.011	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW166	16/01/2018	0089_MW166_S_180116	Normal	205631	<0.001	0.007	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW166	8/01/2020	0089_MW166_200108	Normal	EP2000182	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.67***	10.5	10.6
	MW166	1/04/2020	0089_MW166_200401	Normal	EP2003417	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***15.9***	16.8	17.2
	MW166	21/07/2020	0089_MW166_200721	Normal	EP2007594	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***16.0***	17.0	17.6
	MW166	22/09/2020	0089_MW166_200922	Normal	EP2010151	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.36***	10.2	10.4
	MW166	14/12/2020	0089_MW166_201214	Normal	EP2013984	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.00***	8.60	8.67
	MW166	15/03/2021	0089_MW166_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.14***	9.87	10.1
	MW166	10/06/2021	0089_MW166_210610	Normal	EP2106588	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.8***	12.0	12.6
	MW166	30/08/2021	0089_MW166_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.11***	9.92	10.2
	MW166	10/01/2022	0089_MW166_220110	Normal	EP2200211	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.03***	8.94	9.14
	MW166	15/03/2022	0089_MW166_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.81***	9.15	9.43
	MW166	7/06/2022	0089_MW166_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.67***	9.69	9.94
	MW166	5/09/2022	0089_MW166_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.70***	7.35	7.45
Waste Water Treatment Plant	MW171	7/08/2017	0089_MW171_S_170807	Normal	199149	<0.001	0.008	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW171	18/09/2017	0089_MW171_S_170918	Normal	176030	<0.001	0.006	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW171	19/10/2017	0089_MW171_S_171019	Normal	178275	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW171	15/11/2017	0089_MW171_S_171115	Normal	203378	<0.001	0.005	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW171	7/12/2017	0089_MW171_S_171207	Normal	204323	<0.001	0.007	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW171	16/01/2018	0089_MW171_S_180116	Normal	205631	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW171	1/04/2020	0089_MW171_200401	Normal	EP2003417	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW171	21/07/2020	0089_MW171_200721	Normal	EP2007594	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.55*	0.81	0.81
	MW171	14/12/2020	0089_MW171_201214	Normal	EP2013992	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.23	0.23
	MW171	15/03/2021	0089_MW171_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.18*	0.37	0.40
	MW171	10/06/2021	0089_MW171_210610	Normal	EP2106588	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW171	30/08/2021	0089_MW171_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.35*	0.74	0.82
	MW171	10/01/2022	0089_MW171_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.18*	0.42	0.46
	MW171	15/03/2022	0089_MW171_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.05	0.05
	MW171	7/06/2022	0089_MW171_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.27*	0.58	0.64
	MW171	5/09/2022	0089_MW171_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.16	0.16
Waste Water Treatment Plant	MW172	7/08/2017	0089_MW172_S_170807	Normal	199149	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW172	8/06/2022	0089_MW172_220608	Normal	EP2206971	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.2***	20.4	23.4
	MW172	6/09/2022	0089_MW172_220906	Normal	EP2211400	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***29.6***	35.4	39.0
Waste Water Treatment Plant	MW173	9/08/2017	0089_MW173_S_170809	Normal	199252	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW173	18/09/2017	0089_MW173_S_170918	Normal	176030	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW173	19/10/2017	0089_MW173_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.002	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW173	15/11/2017	0089_MW173_S_171115	Normal	203378	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW173	7/12/2017	0089_MW173_S_171207	Normal	204323	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW173	16/01/2018	0089_MW173_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW173	16/01/2020	0089_MW173_200117	Normal	EP2000515	<0.05	0.13	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.19*	2.71	3.05
	MW173	31/03/2020	0089_MW173_200331	Normal	EP2003364	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.01***	5.70	7.05
	MW173	22/07/2020	0089_MW173_200722	Normal	EP2007667	<0.05	0.22	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.91***	13.7	15.6
	MW173	16/03/2021	0089_MW173_210316	Normal	EP2102833	<0.05	0.13	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.99***	10.2	11.2
	MW173	16/03/2021	0089_QC114_210316	Field Duplicate	EP2102833	<0.05	0.12	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.94***	11.1	12.2
	MW173	16/03/2021	0089_QC214_210316	nterlab Duplicate	781350	<0.01	0.07	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***9.6***	11.36	12.03
	MW173	10/06/2021	0089_MW173_210610	Normal	EP2106579	<0.05	0.23	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.0***	16.1	17.7
	MW173	15/03/2022	0089_MW173_220315	Normal	EP2203018	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.63***	11.7	12.5
	MW173	8/06/2022	0089_MW173_220608	Normal	EP2206969	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.2***	14.7	15.7
	MW173	5/09/2022	0089_MW173_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.20***	10.5	11.2
Waste Water Treatment Plant	MW193	8/08/2017	0089_MW193_S_170808	Normal	199212	<0.001	0.015	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW193	18/09/2017	0089_MW193_S_170918	Normal	176030	<0.001	0.015	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW193	19/10/2017	0089_MW193_S_171019	Normal	178275	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW193	15/11/2017	0089_MW193_S_171115	Normal	203378	<0.001	0.012	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW193	7/12/2017	0089_MW193_S_171207	Normal	204323	<0.001	0.016	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW193	16/01/2018	0089_MW193_S_180116	Normal	205631	<0.001	0.006	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW193	8/01/2020	0089_MW193_200108	Normal	EP2000186	<0.05	0.14	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.21***	13.3	14.5
	MW193	31/03/2020	0089_MW193_200331	Normal	EP2003374	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***21.7***	27.9	30.0
	MW193	15/07/2020	0089_MW193_200715	Normal	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.3***	18.4	20.5
	MW193	16/12/2020	0089_MW193_201216	Normal	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***8.43***	11.5	12.4
	MW193	16/03/2021	0089_MW193_210316	Normal	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.1***	17.4	19.4
	MW193	10/06/2021	0089_MW193_210610	Normal	EP2106580	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.1***	14.2	15.7
	MW193	30/08/2021	0089_MW193_210830	Normal	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.4***	18.4	20.5
	MW193	30/08/2021	0089_QC113_210830	Field Duplicate	EP2110020	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***11.9***	16.8	18.9
	MW193	30/08/2021	0089_QC213_210830	nterlab Duplicate	820919	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	<0.1	<0.05	***13***	18.26	20.42
	MW193	10/01/2022	0089_MW193_220110	Normal	EP2200211	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.60***	9.16	9.86
	MW193	15/03/2022	0089_MW193_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.8***	19.7	21.6
	MW193	7/06/2022	0089_MW193_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.90***	13.3	14.5
	MW193	5/09/2022	0089_MW193_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.9***	16.2	17.8
Waste Water Treatment Plant	MW195D	8/08/2017	0089_MW195_D_170808	Normal	199212	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195D	8/08/2017	0089_QC1MW_S_170808	Field Duplicate	199212	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195D	8/08/2017	0089_QC2MW_170808	nterlab Duplicate	558019	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
	MW195D	8/01/2020	0089_MW195-D_200108	Normal	EP2000186	<0.05	10.9	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	11.4	11.4
	MW195D	31/03/2020	0089_MW195_D_200331	Normal	EP2003364	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195D	15/07/2020	0089_MW195_D_200715	Normal	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195D	21/09/2020	0089_MW195-D_200921	Normal	EP2010093	<0.05	1.40	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	1.57	1.57
	MW195D	16/12/2020	0089_MW195D_201216	Normal	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195D	16/03/2021	0089_MW195D_210316	Normal	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195D	16/03/2021	0089_QC115_210316	Field Duplicate	EP2102833	<0.05	0.36	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.97	0.97
	MW195D	16/03/2021	0089_QC215_210316	nterlab Duplicate	781350	<0.01	0.16	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	0.65	0.65
	MW195D	8/06/2021	0089_QC212_210609	nterlab Duplicate	802464	<0.01	1.2	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	1.45	1.45

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	MW195D	9/06/2021	0089_MW195D_210609	Normal	EP2106514	<0.05	2.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	2.30	2.30
	MW195D	9/06/2021	0089_QC112_210609	Field Duplicate	EP2106514	<0.05	2.52	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	2.86	2.86
	MW195D	30/08/2021	0089_MW195D_210830	Normal	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195D	30/08/2021	0089_QC111_210830	Field Duplicate	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195D	30/08/2021	0089_QC211_210830	nterlab Duplicate	820919	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
	MW195D	10/01/2022	0089_MW195D_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195D	15/03/2022	0089_MW195D_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.14	0.14
	MW195D	7/06/2022	0089_MW195D_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.26	0.26
	MW195D	5/09/2022	0089_MW195D_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	MW195S	8/08/2017	0089_MW195_S_170808	Normal	199212	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	18/09/2017	0089_MW195_S_170918	Normal	176030	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	18/09/2017	0089_QC1MW_170918	Field Duplicate	176030	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	18/09/2017	0089_QC2MW_170918	nterlab Duplicate	564343	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***5.2***	5.25	5.34
	MW195S	19/10/2017	0089_MW195_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.002	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	19/10/2017	0089_QC1MW_171019	Field Duplicate	178275	<0.001	<0.001	<0.001	<0.002	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	19/10/2017	0089_QC2MW_171019	nterlab Duplicate	568924	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.2	0.23
	MW195S	15/11/2017	0089_MW195_S_171115	Normal	203378	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	15/11/2017	0089_QC1MW_171115	Field Duplicate	203378	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	15/11/2017	0089_QC2MW_171115	nterlab Duplicate	573296	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW195S	7/12/2017	0089_MW195_S_171207	Normal	204323	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	7/12/2017	0089_QC1MW_171207	Field Duplicate	204323	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	7/12/2017	0089_QC2MW_171207	nterlab Duplicate	576599	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW195S	16/01/2018	0089_MW195_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	16/01/2018	0089_QC1MW_180116	Field Duplicate	205631	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW195S	16/01/2018	0089_QC2MW_180116	nterlab Duplicate	580891	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW195S	8/01/2020	0089_MW195-S_200108	Normal	EP2000186	<0.05	0.22	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.22	0.22
	MW195S	8/01/2020	0089_QC102_200108	Field Duplicate	EP2000186	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.11	0.11
Waste Water Treatment Plant	MW195S	8/01/2020	0089_QC202_200108	nterlab Duplicate	696100	<0.01	0.15	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	0.15	0.15
	MW195S	31/03/2020	0089_MW195_S_200331	Normal	EP2003364	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	15/07/2020	0089_MW195_S_200715	Normal	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	21/09/2020	0089_MW195-S_200921	Normal	EP2010093	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.01	0.01
	MW195S	21/09/2020	0089_QC108_200921	Field Duplicate	EP2010093	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	21/09/2020	0089_QC208_200921	nterlab Duplicate	746269	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW195S	16/12/2020	0089_MW195S_201216	Normal	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	16/03/2021	0089_MW195S_210316	Normal	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	9/06/2021	0089_MW195S_210609	Normal	EP2106514	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.02	0.02
	MW195S	30/08/2021	0089_MW195S_210830	Normal	EP2110020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	10/01/2022	0089_MW195S_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	10/01/2022	0089_QC106_220110	Field Duplicate	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	10/01/2022	0089_QC206_220110	nterlab Duplicate	854607	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW195S	15/03/2022	0089_MW195S_220315	Normal	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	15/03/2022	0089_QC111_220315	Field Duplicate	EP2203018	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	15/03/2022	0089_QC211_220315	nterlab Duplicate	872903	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW195S	7/06/2022	0089_MW195S_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	7/06/2022	0089_QC111_220607	Field Duplicate	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW195S	7/06/2022	0089_QC211_220607	nterlab Duplicate	896805	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.019	0.033	0.035
	MW195S	5/09/2022	0089_MW195S_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	8/08/2017	0089_MW196_S_170808	Normal	199212	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW196	2/04/2020	0089_MW196_200402	Normal	EP2003472	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	22/07/2020	0089_MW196_200722	Normal	EP2007667	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	24/09/2020	0089_MW196_200924	Normal	EP2010271	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	16/12/2020	0089_MW196_201216	Normal	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	16/12/2020	0089_QC116_201216	Field Duplicate	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	16/12/2020	0089_QC216_201116	nterlab Duplicate	765054	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Waste Water Treatment Plant	MW196	10/06/2021	0089_MW196_210610	Normal	EP2106579	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	30/08/2021	0089_MW196_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	30/08/2021	0089_QC112_210830	Field Duplicate	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	30/08/2021	0089_QC212_210830	nterlab Duplicate	820919	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	<0.1	<0.05	<0.01	<0.1	<0.1
	MW196	13/01/2022	0089_MW196_220113	Normal	EP2200340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	14/03/2022	0089_MW196_220314	Normal	EP2202975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	14/03/2022	0089_QC108_220314	Field Duplicate	EP2202975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW196	14/03/2022	0089_QC208_220314	nterlab Duplicate	872911	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW196	6/09/2022	0089_MW196_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW197	9/08/2017	0089_MW197_S_170809	Normal	199252	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW197	18/09/2017	0089_MW197_S_170918	Normal	176030	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW197	19/10/2017	0089_MW197_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW197	15/11/2017	0089_MW197_S_171115	Normal	203378	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW197	7/12/2017	0089_MW197_S_171207	Normal	204323	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
Waste Water Treatment Plant	MW197	16/01/2018	0089_MW197_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW197	31/03/2020	0089_MW197_200331	Normal	EP2003374	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW197	15/07/2020	0089_MW197_200715	Normal	EP2007382	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW197	16/03/2021	0089_MW197_210316	Normal	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW197	9/06/2021	0089_MW197_210609	Normal	EP2106514	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW197	1/09/2021	0089_MW197_210901	Normal	EP2110159	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW197	7/06/2022	0089_MW197_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW197	5/09/2022	0089_MW197_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	8/08/2017	0089_MW199_S_170808	Normal	199212	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW199	18/09/2017	0089_MW199_S_170918	Normal	176030	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW199	19/10/2017	0089_MW199_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW199	15/11/2017	0089_MW199_S_171115	Normal	203378	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW199	7/12/2017	0089_MW199_S_171207	Normal	204323	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW199	16/01/2018	0089_MW199_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW199	8/01/2020	0089_MW199_200108	Normal	EP2000186	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.12	0.12
	MW199	31/03/2020	0089_MW199_200331	Normal	EP2003364	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Waste Water Treatment Plant	MW199	15/07/2020	0089_MW199_200715	Normal	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	21/09/2020	0089_MW199_200921	Normal	EP2010093	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
	MW199	16/12/2020	0089_MW199_201216	Normal	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	30/08/2021	0089_MW199_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	10/01/2022	0089_MW199_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	17/03/2022	0089_MW199_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	7/06/2022	0089_MW199_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	7/06/2022	0089_QC109_220607	Field Duplicate	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	7/06/2022	0089_QC209_220607	nterlab Duplicate	896805	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.005	0.005	0.005
	MW199	5/09/2022	0089_MW199_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	5/09/2022	0089_QC111_220905	Field Duplicate	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW199	5/09/2022	0089_QC211_220905	nterlab Duplicate	920981	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
Waste Water Treatment Plant	MW200	9/08/2017	0089_MW200_S_170809	Normal	199252	<0.001	0.006	0.002	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW200	18/09/2017	0089_MW200_S_170918	Normal	176030	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW200	19/10/2017	0089_MW200_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.002	<0.01	<0.005	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW200	15/11/2017	0089_MW200_S_171115	Normal	203378	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW200	7/12/2017	0089_MW200_S_171207	Normal	204323	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW200	16/01/2018	0089_MW200_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW200	9/01/2020	0089_MW200_200109	Normal	EP2000249	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
	MW200	31/03/2020	0089_MW200_200331	Normal	EP2003374	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	MW200	15/07/2020	0089_MW200_200715	Normal	EP2007382	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW200	24/09/2020	0089_MW200_200924	Normal	EP2010273	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW200	15/12/2020	0089_MW200_201215	Normal	EP2014051	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW200	15/12/2020	0089_QC115_201215	Field Duplicate	EP2014051	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW200	15/12/2020	0089_QC215_201115	nterlab Duplicate	765054	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW200	16/03/2021	0089_MW200_210316	Normal	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW200	9/06/2021	0089_MW200_210609	Normal	EP2106514	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW200	1/09/2021	0089_MW200_210901	Normal	EP2110159	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW200	10/01/2022	0089_MW200_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW200	14/03/2022	0089_MW200_220314	Normal	EP2202976	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW200	7/06/2022	0089_MW200_220607	Normal	EP2206883	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW200	5/09/2022	0089_MW200_220905	Normal	EP2211340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Waste Water Treatment Plant	MW202	9/08/2017	0089_MW202_S_170809	Normal	199252	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW202	18/09/2017	0089_MW202_S_170918	Normal	176030	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW202	19/10/2017	0089_MW202_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW202	15/11/2017	0089_MW202_S_171115	Normal	203378	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW202	7/12/2017	0089_MW202_S_171207	Normal	204323	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW202	16/01/2018	0089_MW202_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW202	31/03/2020	0089_MW202_200331	Normal	EP2003374	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
	MW202	31/03/2020	0089_QC103_200331	Field Duplicate	EP2003374	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
	MW202	31/03/2020	0089_QC203_200331	nterlab Duplicate	711434	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.06	<0.1
	MW202	22/07/2020	0089_MW202_200722	Normal	EP2007667	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
	MW202	21/09/2020	0089_MW202_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	0.15	0.15
	MW202	21/09/2020	0089_QC112_200921	Field Duplicate	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.11	0.11
	MW202	22/09/2020	0089_QC212_200921	nterlab Duplicate	746269	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.09*	0.09	<0.1
	MW202	16/12/2020	0089_MW202_201216	Normal	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06
	MW202	15/03/2021	0089_MW202_210315	Normal	EP2102755	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09
	MW202	10/06/2021	0089_MW202_210610	Normal	EP2106588	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
	MW202	30/08/2021	0089_MW202_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
	MW202	12/01/2022	0089_MW202_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
	MW202	18/03/2022	0089_MW202_220318	Normal	EP2203194	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
	MW202	8/06/2022	0089_MW202_220608	Normal	EP2206971	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
	MW202	5/09/2022	0089_MW202_220905	Normal	EP2211345	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
Waste Water Treatment Plant	MW203	9/08/2017	0089_MW203_S_170809	Normal	199252	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW203	8/01/2020	0089_MW203_200108	Normal	EP2000182	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.03	0.03
	MW203	31/03/2020	0089_MW203_200331	Normal	EP2003374	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.03	0.05
	MW203	31/03/2020	0089_QC102_200331	Field Duplicate	EP2003374	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.04	0.06
	MW203	31/03/2020	0089_QC202_200331	nterlab Duplicate	711434	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW203	15/07/2020	0089_MW203_200715	Normal	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.04	0.08
	MW203	22/09/2020	0089_MW203_200922	Normal	EP2010141	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.08	0.10
	MW203	16/12/2020	0089_MW203_201216	Normal	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW203	16/03/2021	0089_MW203_210316	Normal	EP2102837	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	0.02
	MW203	9/06/2021	0089_MW203_210609	Normal	EP2106514	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.11	0.11
	MW203	30/08/2021	0089_MW203_210830	Normal	EP2110019	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.11
	MW203	10/01/2022	0089_MW203_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.09	0.11
	MW203	17/03/2022	0089_MW203_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
	MW203	7/06/2022	0089_MW203_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
	MW203	7/06/2022	0089_QC115_220607	Field Duplicate	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
	MW203	7/06/2022	0089_QC215_220607	nterlab Duplicate	896805	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.026	0.071	0.078
	MW203	6/09/2022	0089_MW203_220906	Normal	EP2211390	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
Helicopter Support Facility	MW214	2/08/2017	0089_MW214_S_170802	Normal	198991	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW214	1/09/2021	0089_MW214_210901	Normal	EP2110159	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW214	13/01/2022	0089_MW214_220113	Normal	EP2200340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW214	16/03/2022	0089_MW214_220316	Normal	EP2203057	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW214	7/06/2022	0089_MW214_220607	Normal	EP2206888	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW214	6/09/2022	0089_MW214_220906	Normal	EP2211400	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Helicopter Support Facility	MW215	2/08/2017	0089_MW215_S_170802	Normal	198991	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW215	1/09/2021	0089_MW215_210901	Normal	EP2110159	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.35*	0.38	0.41
	MW215	13/01/2022	0089_MW215_220113	Normal	EP2200340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.47*	0.68	0.74
	MW215	16/03/2022	0089_MW215_220316	Normal	EP2203057	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.61*	1.33	1.45
	MW215	7/06/2022	0089_MW215_220607	Normal	EP2206888	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.80*	1.53	1.70
	MW215	6/09/2022	0089_MW215_220906	Normal	EP2211400	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.73*	1.16	1.29
	MW216	2/08/2017	0089_MW216_S_170802	Normal	198991	<0.001	0.043	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW216	11/09/2017	0089_MW216_S_170911	Normal	175533	<0.001	0.028	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Helicopter Support Facility	MW216	16/10/2017	0089_MW216_S_171016	Normal	177956	<0.001	0.023	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW216	17/11/2017	0089_MW216_S_171117	Normal	203443	<0.001	0.004	<0.001	<0.001	<0.01	<0.05	<0.002	0.006	<0.1	<0.002	<0.05			
	MW216	5/12/2017	0089_MW216_S_171205	Normal	204183	<0.001	0.006	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW216	15/01/2018	0089_MW216_S_180115	Normal	205568	<0.001	0.018	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW216	19/12/2019	0089_MW216_191219	Normal	EP1913598	<0.05	0.22	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.89***	7.80	8.38
	MW216	31/03/2020	0089_MW216_200331	Normal	EP2003366	<0.05	0.35	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.65***	10.3	10.7
	MW216	22/07/2020	0089_MW216_200722	Normal	EP2007667	<0.05	1.18	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.61***	10.1	10.7
	MW216	15/12/2020	0089_MW216_201215	Normal	EP2014041	<0.05	1.32	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.85***	15.6	16.4
	MW216	15/12/2020	0089_QC113_201215	Field Duplicate	EP2014041	<0.05	1.29	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.55***	14.4	15.1
	MW216	15/12/2020	0089_QC213_201115	nterlab Duplicate	765054	<0.01	0.97	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***4.19***	14.23	14.91
	MW216	18/03/2021	0089_MW216_210318	Normal	EP2102955	<0.05	2.17	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.30***	13.3	13.8
	MW216	9/06/2021	0089_MW216_210609	Normal	EP2106514	<0.05	3.81	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.57***	16.0	16.7
	MW216	31/08/2021	0089_MW216_210831	Normal	EP2110071	<0.05	2.71	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.49***	14.8	15.5
	MW216	13/01/2022	0089_MW216_220113	Normal	EP2200340	<0.05	2.23	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.18***	18.1	18.8
	MW216	16/03/2022	0089_MW216_220316	Normal	EP2203057	<0.05	2.91	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.51***	16.5	17.4
	MW216	7/06/2022	0089_MW216_220607	Normal	EP2206888	<0.05	2.95	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.45***	15.1	15.7
	MW216	5/09/2022	0089_MW216_220905	Normal	EP2211340	<0.05	1.58	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.19***	24.5	25.1
Helicopter Support Facility	MW217	2/08/2017	0089_MW217_S_170802	Normal	198991	1.2	9.6	0.093	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW217	11/09/2017	0089_MW217_S_170911	Normal	175533	0.12	17	0.20	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW217	11/09/2017	0089_QC1MW_170911	Field Duplicate	175533	0.12	17	0.18	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW217	11/09/2017	0089_QC2MW_170911	nterlab Duplicate	562844	0.09	3.3	0.48	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.44*	25.63	25.77
	MW217	16/10/2017	0089_MW217_S_171016	Normal	177956	0.031	13	0.11	<0.02	<0.1	<0.05	<0.02	<0.05	<0.2	<0.02	<1			
	MW217	17/11/2017	0089_MW217_S_171117	Normal	203443	0.047	11	0.10	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW217	5/12/2017	0089_MW217_S_171205	Normal	204183	0.16	12	0.10	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW217	15/01/2018	0089_MW217_S_180115	Normal	205568	0.20	16	0.13	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW217	19/12/2019	0089_MW217_191219	Normal	EP1913595	<0.05	32.1	0.55	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	38.8	38.8
	MW217	31/03/2020	0089_MW217_200331	Normal	EP2003366	<0.05	21.0	0.74	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	23.2	23.2
	MW217	22/07/2020	0089_MW217_200722	Normal	EP2007667	<0.05	34.3	0.26	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	43.4	43.5
	MW217	22/07/2020	0089_QC114_200722	Field Duplicate	EP2007667	<0.05	37.4	0.33	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	47.0	47.0
	MW217	22/07/2020	0089_QC214_200722	nterlab Duplicate	734409	0.02	3.0	0.16	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.03	9.6	9.64
	MW217	24/09/2020	0089_MW217_200924	Normal	EP2010271	<0.05	26.2	0.26	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.27*	34.0	34.1
	MW217	15/12/2020	0089_MW217_201215	Normal	EP2014041	<0.05	21.7	0.57	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	27.9	27.9
	MW217	18/03/2021	0089_MW217_210318	Normal	EP2102955	<0.05	28.5	0.34	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	36.4	36.4
	MW217	9/06/2021	0089_MW217_210609	Normal	EP2106514	<0.05	32.6	0.29	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	47.1	47.1
	MW217	31/08/2021	0089_MW217_210831	Normal	EP2110064	<0.05	38.5	0.24	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	56.2	56.2
	MW217	13/01/2022	0089_MW217_220113	Normal	EP2200339	<0.05	25.6	0.26	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	51.9	52.0
	MW217	17/03/2022	0089_MW217_220317	Normal	EP2203138	<0.05	27.2	0.48	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	52.5	52.5
	MW217	8/06/2022	0089_MW217_220608	Normal	EP2206971	<0.05	20.7	0.21	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	33.9	33.9
	MW217	8/09/2022	0089_MW217_220908	Normal	EP2211535	<0.05	12.5	0.24	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	24.5	24.5
Helicopter Support Facility	MW220	26/02/2016	HDF_MB50	Normal	EP1601702		<0.1	<0.1											
	MW220	4/11/2016	HSF_MB50	Normal	522565		0.36												
	MW220	2/08/2017	0089_MW220_S_170802	Normal	198991	0.004	0.15	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW220	11/09/2017	0089_MW220_S_170911	Normal	175533	<0.001	0.050	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW220	16/10/2017	0089_MW220_S_171016	Normal	177956	<0.001	0.029	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW220	17/11/2017	0089_MW220_S_171117	Normal	203443	<0.001	0.44	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW220	5/12/2017	0089_MW220_S_171205	Normal	204183	<0.001	0.46	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW220	5/12/2017	0089_QC1MW_171205	Field Duplicate	204183	<0.001	0.47	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW220	5/12/2017	0089_QC2MW_171205	nterlab Duplicate	576083	<0.01	0.62	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***2.56***	4.67	4.93
	MW220	15/01/2018	0089_MW220_S_180115	Normal	205568	<0.001	1.1	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW220	9/06/2021	0089_MW220_210609	Normal	EP2106514	<0.05	0.15	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.0***	15.3	15.9
	MW220	13/01/2022	0089_MW220_220113	Normal	EP2200339	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***77.4***	82.2	83.2
	MW220	8/06/2022	0089_MW220_220608	Normal	EP2206971	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***27.5***	30.2	30.9
	MW220	8/09/2022	0089_MW220_220908	Normal	EP2211535	<0.05	0.14	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***34.4***	37.3	38.0
Helicopter Support Facility	MW224	9/08/2017	0089_MW224_S_170809	Normal	199252	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW224	19/12/2019	0089_MW224_191219	Normal	EP1913595	<0.05	0.96	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	1.06	1.06
	MW224	31/03/2020	0089_MW224_200331	Normal	EP2003366	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
	MW224	22/07/2020	0089_MW224_200722	Normal	EP2007667	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
	MW224	24/09/2020	0089_MW224_200924	Normal	EP2010273	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW224	15/12/2020	0089_MW224_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW224	18/03/2021	0089_MW224_210318	Normal	EP2102955	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW224	9/06/2021	0089_MW224_210609	Normal	EP2106514	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW224	31/08/2021	0089_MW224_210831	Normal	EP2110064	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW224	12/01/2022	0089_QC218_220113	nterlab Duplicate	855202	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW224	13/01/2022	0089_MW224_220113	Normal	EP2200339	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW224	13/01/2022	0089_QC118_220113	Field Duplicate	EP2200339	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW224	17/03/2022	0089_MW224_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
	MW224	8/06/2022	0089_MW224_220608	Normal	EP2206971	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10
	MW224	8/09/2022	0089_MW224_220908	Normal	EP2211535	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
Helicopter Support Facility	MW225	2/08/2017	0089_MW225_S_170802	Normal	198991	0.001	0.029	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW225	11/09/2017	0089_MW225_S_170911	Normal	175533	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW225	19/10/2017	0089_MW225_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW225	17/11/2017	0089_MW225_S_171117	Normal	203443	<0.001	0.002	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW225	5/12/2017	0089_MW225_S_171205	Normal	204183	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW225	15/01/2018	0089_MW225_S_180115	Normal	205568	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW225	1/09/2021	0089_MW225_210901	Normal	EP2110160	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW225	13/01/2022	0089_MW225_220113	Normal	EP2200340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW225	16/03/2022	0089_MW225_220316	Normal	EP2203057	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW225	7/06/2022	0089_MW225_220607	Normal	EP2206888	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW225	7/06/2022	0089_QC112_220607	Field Duplicate	EP2206888	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW225	7/06/2022	0089_QC212_220607	nterlab Duplicate	896805	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	<0.002	<0.001	<0.001
	MW225	6/09/2022	0089_MW225_220906	Normal	EP2211400	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	2/08/2017	0089_MW226_S_170802	Normal	198991	<0.001	0.011	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW226	2/08/2017	0089_QC1MW_170802	Field Duplicate	198991	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW226	3/08/2017	0089_QC2MW_170802	nterlab Duplicate	557195	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Helicopter Support Facility	MW226	11/09/2017	0089_MW226_S_170911	Normal	175533	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW226	19/10/2017	0089_MW226_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW226	17/11/2017	0089_MW226_S_171117	Normal	203443	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW226	5/12/2017	0089_MW226_S_171205	Normal	204183	<0.005	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW226	15/01/2018	0089_MW226_S_180115	Normal	205568	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW226	14/01/2020	0089_MW226_200114	Normal	EP2000432	<0.05	0.48	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.48	0.48
	MW226	2/04/2020	0089_MW226_200402	Normal	EP2003472	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	2/04/2020	0089_QC101_200402	Field Duplicate	EP2003472	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	2/04/2020	0089_QC201_200402	Interlab Duplicate	712006	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
	MW226	21/07/2020	0089_MW226_200721	Normal	EP2007611	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	22/09/2020	0089_MW226_200922	Normal	EP2010143	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	15/12/2020	0089_MW226_201215	Normal	EP2014042	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	17/03/2021	0089_MW226_210317	Normal	EP2102900	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	10/06/2021	0089_MW226_210610	Normal	EP2106588	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	31/08/2021	0089_MW226_210831	Normal	EP2110071	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	13/01/2022	0089_MW226_220113	Normal	EP2200340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	16/03/2022	0089_MW226_220316	Normal	EP2203057	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW226	7/06/2022	0089_MW226_220607	Normal	EP2206888	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW226	6/09/2022	0089_MW226_220906	Normal	EP2211390	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
Helicopter Support Facility	MW227	2/08/2017	0089_MW227_S_170802	Normal	198991	0.002	0.033	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW227	11/09/2017	0089_MW227_S_170911	Normal	175533	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW227	19/10/2017	0089_MW227_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW227	17/11/2017	0089_MW227_S_171117	Normal	203443	<0.001	0.004	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW227	5/12/2017	0089_MW227_S_171205	Normal	204183	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW227	15/01/2018	0089_MW227_S_180115	Normal	205568	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW227	1/04/2020	0089_MW227_200401	Normal	EP2003417	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	1/04/2020	0089_QC104_200401	Field Duplicate	EP2003417	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	1/04/2020	0089_QC204_200401	Interlab Duplicate	711709	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW227	22/07/2020	0089_MW227_200722	Normal	EP2007648	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	21/09/2020	0089_MW227_200921	Normal	EP2010085	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	15/12/2020	0089_MW227_201215	Normal	EP2014051	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	15/03/2021	0089_MW227_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	10/06/2021	0089_MW227_210610	Normal	EP2106588	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	31/08/2021	0089_MW227_210831	Normal	EP2110071	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	14/01/2022	0089_MW227_220114	Normal	EP2200399	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	16/03/2022	0089_MW227_220316	Normal	EP2203057	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	7/06/2022	0089_MW227_220607	Normal	EP2206888	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW227	7/09/2022	0089_MW227_220907	Normal	EP2211611	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
Helicopter Support Facility	MW228	2/08/2017	0089_MW228_S_170802	Normal	198991	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW228	11/09/2017	0089_MW228_S_170911	Normal	175533	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW228	19/10/2017	0089_MW228_S_171019	Normal	178275	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW228	17/11/2017	0089_MW228_S_171117	Normal	203443	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW228	5/12/2017	0089_MW228_S_171205	Normal	204183	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW228	15/01/2018	0089_MW228_S_180115	Normal	205568	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW228	15/01/2018	0089_QC1MW_180115	Field Duplicate	205568	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW228	15/01/2018	0089_QC2MW_180115	Interlab Duplicate	580891	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	0.14	0.14
	MW228	14/01/2020	0089_MW228_200114	Normal	EP2000432	<0.05	0.50	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	26.1	26.1
	MW228	1/04/2020	0089_MW228_200401	Normal	EP2003417	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	32.2	32.2
	MW228	1/04/2020	0089_QC103_200401	Field Duplicate	EP2003417	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	11.1	11.1
	MW228	1/04/2020	0089_QC203_200401	Interlab Duplicate	711709	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	16.45	16.49
	MW228	22/07/2020	0089_MW228_200722	Normal	EP2007648	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	12.3	12.3
	MW228	22/07/2020	0089_QC112_200722	Field Duplicate	EP2007648	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	12.7	12.7
	MW228	22/07/2020	0089_QC212_200722	Interlab Duplicate	734409	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	6.39	6.39
	MW228	21/09/2020	0089_MW228_200921	Normal	EP2010085	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	23.6	23.6
	MW228	15/12/2020	0089_MW228_201215	Normal	EP2014047	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	37.1	37.2
	MW228	15/03/2021	0089_MW228_210315	Normal	EP2102752	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	21.6	21.6
	MW228	10/06/2021	0089_MW228_210610	Normal	EP2106588	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	11.6	11.6
	MW228	31/08/2021	0089_MW228_210831	Normal	EP2110071	<0.05	0.40	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.13*	26.4	26.6
	MW228	14/01/2022	0089_MW228_220114	Normal	EP2200399	<0.05	0.27	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	25.9	26.0
	MW228	16/03/2022	0089_MW228_220316	Normal	EP2203057	<0.05	0.23	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	24.2	24.2
	MW228	7/06/2022	0089_MW228_220607	Normal	EP2206888	<0.05	0.19	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	18.3	18.3
	MW228	7/09/2022	0089_MW228_220907	Normal	EP2211495	<0.05	0.24	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.12*	8.11	8.17
Infiltration Swale	MW233	8/08/2017	0089_MW233_S_170808	Normal	199212	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW233	13/09/2017	0089_MW233_S_170913	Normal	175739	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW233	20/10/2017	0089_MW233_S_171020	Normal	178263	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW233	21/11/2017	0089_MW233_S_171121	Normal	203587	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW233	5/12/2017	0089_MW233_S_171205	Normal	204183	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW233	19/01/2018	0089_MW233_S_180119	Normal	205805	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW233	8/01/2020	0089_MW233_200108	Normal	EP2000182	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.52*	0.52	0.52
	MW233	30/03/2020	0089_MW233_200330	Normal	EP2003313	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.37*	0.37	0.37
	MW233	15/07/2020	0089_MW233_200715	Normal	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.27	0.27
	MW233	15/07/2020	0089_QC107_200715	Field Duplicate	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.24*	0.27	0.27
	MW233	15/07/2020	0089_QC207_200215	Interlab Duplicate	732844	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.2*	0.22	0.23
	MW233	21/09/2020	0089_MW233_200921	Normal	EP2010085	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.29*	0.29	0.29
	MW233	15/12/2020	0089_MW233_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.25*	0.25	0.25
	MW233	15/03/2021	0089_MW233_210315	Normal	EP2102755	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.21*	0.21	0.21
	MW233	15/03/2021	0089_QC104_210315	Field Duplicate	EP2102755	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.26	0.26
	MW233	15/03/2021	0089_QC204_210315	Interlab Duplicate	781350	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.21*	0.22	0.22
	MW233	9/06/2021	0089_MW233_210609	Normal	EP2106515	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.18*	0.18	0.18
	MW233	30/08/2021	0089_MW233_210830	Normal	EP2110016	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.41*	0.41	0.41
	MW233	30/08/2021	0089_QC102_210830	Field Duplicate	EP2110016	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.37*	0.39	0.39
	MW233	30/08/2021	0089_QC202_210830	Interlab Duplicate	820919	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	*0.34*	0.34	0.34
	MW233	10/01/2022	0089_MW233_220110	Normal	EP2200216	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.35*	0.35	0.35
	MW233	17/03/2022	0089_MW233_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.25*	0.25	0.25

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	MW233	8/06/2022	0089_MW233_220608	Normal	EP2206969	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.12*	0.12	0.12
	MW233	6/09/2022	0089_MW233_220906	Normal	EP2211390	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
	MW236	8/08/2017	0089_MW236_S_170808	Normal	199212	<0.001	0.01	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW236	13/09/2017	0089_MW236_S_170913	Normal	175739	<0.001	0.009	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW236	20/10/2017	0089_MW236_S_171020	Normal	178263	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.50			
	MW236	21/11/2017	0089_MW236_S_171121	Normal	203587	<0.001	0.016	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW236	5/12/2017	0089_MW236_S_171205	Normal	204183	<0.01	0.016	<0.01	<0.01	<0.1	<0.01	<0.02	<0.05	<0.02	<0.02	<0.5			
	MW236	19/01/2018	0089_MW236_S_180119	Normal	205805	<0.01	0.028	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW236	2/04/2020	0089_MW236_200402	Normal	EP2003472	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***87.5***	90.8	94.9
	MW236	16/07/2020	0089_MW236_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***75.0***	78.1	82.8
Fuel Farm	MW236	16/07/2020	0089_QC108_200716	Field Duplicate	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***82.9***	86.3	91.3
	MW236	20/07/2020	0089_QC208_200716	Interlab Duplicate	733018	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***75***	77.65	81.45
	MW236	21/09/2020	0089_MW236_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***83.8***	87.6	93.0
	MW236	15/12/2020	0089_MW236_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***57.5***	60.3	63.4
	MW236	16/03/2021	0089_MW236_210316	Normal	EP2102833	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***71.2***	75.5	80.6
	MW236	10/06/2021	0089_MW236_210610	Normal	EP2106579	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***53.5***	56.1	58.9
	MW236	31/08/2021	0089_MW236_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***60.8***	65.9	71.1
	MW236	10/01/2022	0089_MW236_220110	Normal	EP2200211	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***84.5***	90.3	95.6
	MW236	7/06/2022	0089_MW236_220607	Normal	EP2206880	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***103***	106	112
	MW236	6/09/2022	0089_MW236_220906	Normal	EP2211390	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***117***	122	127
	MW238	4/08/2017	0089_MW238_S_170804	Normal	199095	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW238	13/09/2017	0089_MW238_S_170913	Normal	175739	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW238	13/09/2017	0089_QC1MW_170913	Field Duplicate	175739	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW238	13/09/2017	0089_QC2MW_170913	Interlab Duplicate	565731	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1
	MW238	20/10/2017	0089_MW238_S_171020	Normal	178263	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW238	21/11/2017	0089_MW238_S_171121	Normal	203587	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW238	5/12/2017	0089_MW238_S_171205	Normal	204183	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW238	19/01/2018	0089_MW238_S_180119	Normal	205805	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW238	14/01/2020	0089_MW238_200114	Normal	EP2000432	<0.05	0.20	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.21	0.21
	MW238	1/04/2020	0089_MW238_200401	Normal	EP2003438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW238	16/07/2020	0089_MW238_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
AVCAT Storage	MW238	21/09/2020	0089_MW238_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
	MW238	15/12/2020	0089_MW238_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW238	15/12/2020	0089_QC114_201215	Field Duplicate	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW238	15/12/2020	0089_QC214_201115	Interlab Duplicate	765054	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.1
	MW238	18/03/2021	0089_MW238_210318	Normal	EP2102955	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW238	10/06/2021	0089_MW238_210610	Normal	EP2106580	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW238	31/08/2021	0089_MW238_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW238	12/01/2022	0089_MW238_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW238	18/03/2022	0089_MW238_220318	Normal	EP2203194	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	MW238	9/06/2022	0089_MW238_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW238	6/09/2022	0089_MW238_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW239	4/08/2017	0089_MW239_S_170804	Normal	199095	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW239	22/07/2020	0089_MW239_200722	Normal	EP2007648	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.06	0.10
	MW239	21/09/2020	0089_MW239_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.16	0.24
	MW239	15/12/2020	0089_MW239_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.10	0.15
	MW239	18/03/2021	0089_MW239_210318	Normal	EP2102954	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.18	0.25
AVCAT Storage	MW239	10/06/2021	0089_MW239_210610	Normal	EP2106579	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.14	0.21
	MW239	31/08/2021	0089_MW239_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.03	0.06
	MW239	12/01/2022	0089_MW239_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	MW239	18/03/2022	0089_MW239_220318	Normal	EP2203194	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.05
	MW239	9/06/2022	0089_MW239_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW239	6/09/2022	0089_MW239_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
	MW240	4/08/2017	0089_MW240_S_170804	Normal	199095	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW240	14/01/2020	0089_MW240_200114	Normal	EP2000432	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.10***	5.74	6.01
	MW240	1/04/2020	0089_MW240_200401	Normal	EP2003438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.98*	1.08	1.15
	MW240	16/07/2020	0089_MW240_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.81*	0.89	0.98
	MW240	21/09/2020	0089_MW240_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.00***	5.60	6.13
	MW240	21/09/2020	0089_QC106_200921	Field Duplicate	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.51***	3.92	4.27
	MW240	21/09/2020	0089_QC206_200921	Interlab Duplicate	746269	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***2.7***	3.01	3.19
	MW240	15/12/2020	0089_MW240_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.34*	1.53	1.64
AVCAT Storage	MW240	18/03/2021	0089_MW240_210318	Normal	EP2102954	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.26***	3.81	4.09
	MW240	10/06/2021	0089_MW240_210610	Normal	EP2106580	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.24***	3.68	4.01
	MW240	31/08/2021	0089_MW240_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.21***	4.70	5.03
	MW240	12/01/2022	0089_MW240_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.69*	0.75	0.75
	MW240	12/01/2022	0089_QC115_220112	Field Duplicate	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.69*	0.75	0.75
	MW240	12/01/2022	0089_QC215_220112	Interlab Duplicate	855202	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.66*	0.7	0.7
	MW240	18/03/2022	0089_MW240_220318	Normal	EP2203194	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.07*	1.16	1.16
	MW240	9/06/2022	0089_MW240_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.46***	4.82	5.13
	MW240	6/09/2022	0089_MW240_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.80***	4.11	4.17
	MW242	7/08/2017	0089_MW242_S_170807	Normal	199149	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW242	8/01/2020	0089_MW242_200108	Normal	EP2000182	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW242	30/03/2020	0089_MW242_200330	Normal	EP2003313	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW242	16/07/2020	0089_MW242_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
	MW242	21/09/2020	0089_MW242_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW242	15/12/2020	0089_MW242_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
AVCAT Storage	MW242	18/03/2021	0089_MW242_210318	Normal	EP2102954	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
	MW242	9/06/2021	0089_MW242_210609	Normal	EP2106516	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
	MW242	31/08/2021	0089_MW242_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW242	12/01/2022	0089_MW242_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW242	17/03/2022	0089_MW242_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
	MW242	8/06/2022	0089_MW242_220608	Normal	EP2206969	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02
	MW242	6/09/2022	0089_MW242_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01
	MW243	4/08/2017	0089_MW243_S_170804	Normal	199095	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
AVCAT Storage	MW243	13/09/2017	0089_MW243_S_170913	Normal	175739	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW243	20/10/2017	0089_MW243_S_171020	Normal	178263	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW243	21/11/2017	0089_MW243_S_171121	Normal	203587	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW243	5/12/2017	0089_MW243_S_171205	Normal	204183	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW243	19/01/2018	0089_MW243_S_180119	Normal	205805	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW243	14/01/2020	0089_MW243_200114	Normal	EP2000432	<0.05	0.09	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.12	0.12
	MW243	1/04/2020	0089_MW243_200401	Normal	EP2003438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW243	16/07/2020	0089_MW243_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.10	0.10
	MW243	21/09/2020	0089_MW243_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06
	MW243	15/12/2020	0089_MW243_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
	MW243	18/03/2021	0089_MW243_210318	Normal	EP2102955	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
	MW243	10/06/2021	0089_MW243_210610	Normal	EP2106579	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.77*	0.77	0.77
	MW243	31/08/2021	0089_MW243_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.53*	0.53	0.53
	MW243	12/01/2022	0089_MW243_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09
	MW243	18/03/2022	0089_MW243_220318	Normal	EP2203194	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
	MW243	9/06/2022	0089_MW243_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.27*	0.27	0.27
	MW243	6/09/2022	0089_MW243_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.27*	0.27	0.27
AVCAT Storage	MW245	4/08/2017	0089_MW245_S_170804	Normal	199095	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW245	13/09/2017	0089_MW245_S_170913	Normal	175739	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW245	20/10/2017	0089_MW245_S_171020	Normal	178263	<0.010	0.001	<0.010	<0.010	<0.10	<0.05	<0.020	<0.050	<0.1	<0.020	<0.50			
	MW245	21/11/2017	0089_MW245_S_171121	Normal	203587	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW245	5/12/2017	0089_MW245_S_171205	Normal	204183	<0.005	0.020	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW245	19/01/2018	0089_MW245_S_180119	Normal	205805	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW245	14/01/2020	0089_MW245_200114	Normal	EP2000432	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.35*	0.35	0.35
	MW245	1/04/2020	0089_MW245_200401	Normal	EP2003438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
	MW245	16/07/2020	0089_MW245_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.34*	0.38	0.38
	MW245	21/09/2020	0089_MW245_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.32*	0.36	0.36
	MW245	15/12/2020	0089_MW245_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.18*	0.18	0.18
	MW245	18/03/2021	0089_MW245_210318	Normal	EP2102955	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
	MW245	10/06/2021	0089_MW245_210610	Normal	EP2106579	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.19*	0.19	0.19
	MW245	31/08/2021	0089_MW245_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10
	MW245	12/01/2022	0089_MW245_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09
	MW245	18/03/2022	0089_MW245_220318	Normal	EP2203194	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
	MW245	9/06/2022	0089_MW245_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07
	MW245	6/09/2022	0089_MW245_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
AVCAT Storage	MW249	7/08/2017	0089_MW249_S_170807	Normal	199149	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW249	13/09/2017	0089_MW249_S_170913	Normal	175739	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW249	20/10/2017	0089_MW249_S_171020	Normal	178263	<0.001	0.004	0.004	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW249	21/11/2017	0089_MW249_S_171121	Normal	203587	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW249	5/12/2017	0089_MW249_S_171205	Normal	204183	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.02	<0.002	<0.05			
	MW249	19/01/2018	0089_MW249_S_180119	Normal	205805	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW249	8/01/2020	0089_MW249_200108	Normal	EP2000182	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.44*	0.44	0.44
	MW249	30/03/2020	0089_MW249_200330	Normal	EP2003313	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.19*	0.19	0.19
	MW249	16/07/2020	0089_MW249_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.16*	0.16	0.16
	MW249	16/07/2020	0089_QC110_200716	Field Duplicate	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.20*	0.20	0.20
	MW249	20/07/2020	0089_QC210_200716	nterlab Duplicate	733018	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.14*	0.14	0.14
	MW249	21/09/2020	0089_MW249_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.29*	1.35	1.38
	MW249	21/09/2020	0089_QC109_200921	Field Duplicate	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.34*	1.40	1.42
	MW249	21/09/2020	0089_QC209_200921	nterlab Duplicate	746269	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.97*	1.01	1.03
	MW249	15/12/2020	0089_MW249_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.30*	0.30	0.30
	MW249	15/03/2021	0089_MW249_210315	Normal	EP2102755	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.17*	0.17	0.17
	MW249	9/06/2021	0089_MW249_210609	Normal	EP2106515	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.22*	0.22	0.22
	MW249	31/08/2021	0089_MW249_210831	Normal	EP2110071	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.27*	0.29	0.29
	MW249	12/01/2022	0089_MW249_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.30	0.30
	MW249	17/03/2022	0089_MW249_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10
	MW249	8/06/2022	0089_MW249_220608	Normal	EP2206969	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.24*	0.24	0.26
	MW249	6/09/2022	0089_MW249_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.23*	0.26	0.26
Fire Station	MW255	4/08/2017	0089_MW255_S_170804	Normal	199095	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW255	13/09/2017	0089_MW255_S_170913	Normal	175739	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW255	20/10/2017	0089_MW255_S_171020	Normal	178263	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW255	21/11/2017	0089_MW255_S_171121	Normal	203587	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW255	8/12/2017	0089_MW255_S_171208	Normal	204353	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW255	19/01/2018	0089_MW255_S_180119	Normal	205805	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW255	16/07/2020	0089_MW255_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.04***	2.59	2.78
	MW255	16/07/2020	0089_QC109_200716	Field Duplicate	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.47***	3.07	3.28
	MW255	20/07/2020	0089_QC209_200716	nterlab Duplicate	733018	0.01	<0.05	<0.01	0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*1.99*	2.61	2.92
	MW255	22/09/2020	0089_MW255_200922	Normal	EP2010141	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***15.3***	18.4	20.0
	MW255	22/09/2020	0089_QC114_200922	Field Duplicate	EP2010141	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***15.6***	19.0	20.2
	MW255	22/09/2020	0089_QC214_200921	nterlab Duplicate	746269	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***10.59***	12.64	13.57
	MW255	16/12/2020	0089_MW255_201216	Normal	EP2014106	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.38***	4.00	4.22
	MW255	17/03/2021	0089_MW255_210317	Normal	EP2102900	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.70*	2.08	2.15
	MW255	10/06/2021	0089_MW255_210610	Normal	EP2106580	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.68*	2.06	2.14
	MW255	31/08/2021	0089_MW255_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***7.79***	8.65	9.14
	MW255	10/01/2022	0089_MW255_220110	Normal	EP2200211	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.06*	1.26	1.30
	MW255	17/03/2022	0089_MW255_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.87*	1.26	1.32
	MW255	9/06/2022	0089_MW255_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.54*	1.64	1.73
	MW255	6/09/2022	0089_MW255_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.89*	2.85	3.18
	MW256	4/08/2017	0089_MW256_S_170804	Normal	199095	<0.001	0.008	<0.001	<0.001	0.06	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW256	13/09/2017	0089_MW256_S_170913	Normal	175739	<0.001	0.005	<0.001	<0.001	0.06	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW256	20/10/2017	0089_MW256_S_171020	Normal	178263	<0.001	0.01	0.002	<0.001	0.02	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW256	21/11/2017	0089_MW256_S_171121	Normal	203587	<0.001	0.017	0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW256	8/12/2017	0089_MW256_S_171208	Normal	204353	<0.001	0.022	<0.001	<0.001	0.07	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW256	19/01/2018	0089_MW256_S_180119	Normal	205805	<0.001	0.023	0.001	<0.001	0.07	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW256	30/03/2020	0089_MW256_200330	Normal	EP2003313	<0.05	0.26	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***17.2***	23.5	25.2

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Fire Station	MW256	16/07/2020	0089_MW256_200716	Normal	EP2007438	<0.05	0.10	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***11.9***	15.2	16.4
	MW256	22/09/2020	0089_MW256_200922	Normal	EP2010141	<0.05	0.40	<0.05	<0.05	0.14	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***22.0***	27.4	29.0
	MW256	14/12/2020	0089_MW256_201214	Normal	EP2013975	<0.05	0.19	<0.05	<0.05	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.80***	12.4	13.0
	MW256	17/03/2021	0089_MW256_210317	Normal	EP2102900	<0.05	0.21	<0.05	<0.05	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.2***	12.8	13.4
	MW256	10/06/2021	0089_MW256_210610	Normal	EP2106579	<0.05	0.14	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***75.0***	84.4	89.7
	MW256	10/06/2021	0089_QC113_210610	Field Duplicate	EP2106579	<0.05	0.13	<0.05	<0.05	0.07	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***65.0***	75.0	79.7
	MW256	10/06/2021	0089_QC213_210610	nterlab Duplicate	802734	<0.01	0.07	<0.01	<0.01	0.19	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***56***	65.92	72.6
	MW256	31/08/2021	0089_MW256_210831	Normal	EP2110064	<0.05	0.25	<0.05	<0.05	0.07	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***18.4***	24.7	25.9
	MW256	10/01/2022	0089_MW256_220110	Normal	EP2200211	<0.05	0.44	<0.05	<0.05	0.07	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.2***	19.0	19.9
	MW256	10/01/2022	0089_QC110_220110	Field Duplicate	EP2200211	<0.05	0.44	<0.05	<0.05	0.06	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.4***	17.8	18.7
	MW256	10/01/2022	0089_QC210_220110	nterlab Duplicate	854607	<0.01	0.32	<0.01	<0.01	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***12***	15.52	16.76
	MW256	17/03/2022	0089_MW256_220317	Normal	EP2203138	<0.05	0.23	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***21.4***	33.8	36.0
	MW256	9/06/2022	0089_MW256_220609	Normal	EP2207028	<0.05	0.16	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.8***	17.0	17.9
	MW256	6/09/2022	0089_MW256_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.4***	16.0	16.7
Flammable / hazardous goods and waste storage area	MW257	4/08/2017	0089_MW257_S_170804	Normal	199095	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW257	13/09/2017	0089_MW257_S_170913	Normal	175739	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW257	20/10/2017	0089_MW257_S_171020	Normal	178263	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW257	21/11/2017	0089_MW257_S_171121	Normal	203587	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW257	8/12/2017	0089_MW257_S_171208	Normal	204353	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW257	19/01/2018	0089_MW257_S_180119	Normal	205805	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW257	19/12/2019	0089_MW257_191219	Normal	EP1913598	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.20	0.20
	MW257	2/04/2020	0089_MW257_200402	Normal	EP2003472	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.05	0.05
	MW257	16/07/2020	0089_MW257_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.04	0.07
	MW257	22/09/2020	0089_MW257_200922	Normal	EP2010141	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.53*	0.57	0.72
	MW257	16/12/2020	0089_MW257_201216	Normal	EP2014106	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
	MW257	18/03/2021	0089_MW257_210318	Normal	EP2102954	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06
	MW257	9/06/2021	0089_MW257_210609	Normal	EP2106516	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.13	0.13
	MW257	31/08/2021	0089_MW257_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.98*	1.21	1.34
	MW257	10/01/2022	0089_MW257_220110	Normal	EP2200211	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04
	MW257	17/03/2022	0089_MW257_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08
	MW257	9/06/2022	0089_MW257_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06
	MW257	6/09/2022	0089_MW257_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.36*	0.47	0.47
Flammable / hazardous goods and waste storage area	MW258	4/08/2017	0089_MW258_S_170804	Normal	199095	0.001	0.15	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW258	13/09/2017	0089_MW258_S_170913	Normal	175739	<0.001	0.18	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW258	20/10/2017	0089_MW258_S_171020	Normal	178263	<0.01	0.15	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW258	21/11/2017	0089_MW258_S_171121	Normal	203587	<0.001	0.10	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW258	8/12/2017	0089_MW258_S_171208	Normal	204353	<0.001	0.18	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW258	19/01/2018	0089_MW258_S_180119	Normal	205805	<0.01	0.092	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW258	8/06/2022	0089_MW258_220608	Normal	EP2206971	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.41***	7.80	8.72
	MW258	6/09/2022	0089_MW258_220906	Normal	EP2211389	<0.05	0.18	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***24.8***	46.6	52.3
Flammable / hazardous goods and waste storage area	MW259	4/08/2017	0089_MW259_S_170804	Normal	199095	<0.001	0.002	<0.001	<0.001	0.02	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW259	13/09/2017	0089_MW259_S_170913	Normal	175739	<0.001	0.002	<0.001	<0.001	0.02	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW259	20/10/2017	0089_MW259_S_171020	Normal	178263	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW259	21/11/2017	0089_MW259_S_171121	Normal	203587	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW259	8/12/2017	0089_MW259_S_171208	Normal	204353	<0.001	0.004	<0.001	<0.001	0.02	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW259	19/01/2018	0089_MW259_S_180119	Normal	205805	<0.01	0.011	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW259	16/07/2020	0089_MW259_200716	Normal	EP2007438	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.20***	14.4	15.4
	MW259	22/09/2020	0089_MW259_200922	Normal	EP2010141	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.36***	6.54	7.38
	MW259	16/12/2020	0089_MW259_201216	Normal	EP2014092	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.51*	0.85	0.92
	MW259	18/03/2021	0089_MW259_210318	Normal	EP2102954	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.44*	0.68	0.70
	MW259	10/06/2021	0089_MW259_210610	Normal	EP2106580	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.54*	0.81	0.85
	MW259	31/08/2021	0089_MW259_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.14*	0.29	0.29
	MW259	11/01/2022	0089_MW259_220111	Normal	EP2200241	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.13*	0.15	0.15
	MW259	17/03/2022	0089_MW259_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	1.36	1.38
	MW259	9/06/2022	0089_MW259_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.36	0.36
	MW259	6/09/2022	0089_MW259_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.40*	0.73	0.81
Ship sullage area	MW261	12/01/2017	E06_B88_MB01_170112	Normal	530261		<0.05												
	MW261	4/08/2017	0089_MW261_S_170804	Normal	199095	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW261	26/09/2019	0089_MW261_190926	Normal	679542	<0.001	<0.005	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0408	0.0618	0.0758
	MW261	25/10/2019	0089_MW261_191025	Normal	EP1911020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09
	MW261	19/12/2019	0089_MW261_191219	Normal	EP1913595	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.16*	0.16	0.18
	MW261	19/12/2019	0089_QC102_191219	Field Duplicate	EP1913595	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09
	MW261	19/12/2019	0089_QC202_191219	nterlab Duplicate	695528	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.76*	0.92	0.98
	MW261	30/03/2020	0089_MW261_200330	Normal	EP2003313	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.16*	0.16	0.16
	MW261	21/07/2020	0089_MW261_200721	Normal	EP2007611	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.19*	0.19	0.21
	MW261	22/09/2020	0089_MW261_200922	Normal	EP2010141	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.46*	0.49	0.49
	MW261	16/12/2020	0089_MW261_201216	Normal	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.23*	0.23	0.23
	MW261	18/03/2021	0089_MW261_210318	Normal	EP2102954	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.29	0.29
	MW261	9/06/2021	0089_MW261_210609	Normal	EP2106516	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.11*	0.11	0.11
	MW261	31/08/2021	0089_MW261_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.13*	0.13	0.13
	MW261	11/01/2022	0089_MW261_220111	Normal	EP2200241	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05
	MW261	17/03/2022	0089_MW261_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03
Dredge spoil	MW268	1/08/2017	0089_MW268_S_170801	Normal	198918	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW268	19/09/2017	0089_MW268_S_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW268	16/10/2017	0089_MW268_S_171016	Normal	177956	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW268	17/11/2017	0089_MW268_S_171117	Normal	203443	<0.001	0.004	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW268	7/12/2017	0089_MW268_S_171207	Normal	204323	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW268	16/01/2018	0089_MW268_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW268	19/12/2019	0089_MW268_191219	Normal	EP1913595	<0.05	0.14	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.80*	1.12	1.24
	MW268	30/03/2020	0089_MW268_200330	Normal	EP2003313	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.49*	0.64	0.75
	MW268	21/07/2020	0089_MW268_200721	Normal	EP2007611	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.39*	0.56	0.68
	MW268	21/09/2020	0089_MW268_200921	Normal	EP2010085	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.37*	0.51	0.60
	MW268	14/12/2020	0089_MW268_201214	Normal	EP2013975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.20*	0.26	0.30
	MW268	16/03/2021	0089_MW268_210316	Normal	EP2102837	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.30*	0.40	0.46

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	MW268	16/03/2021	0089_QC116_210316	Field Duplicate	EP2102837	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.26*	0.33	0.38
	MW268	16/03/2021	0089_QC216_210316	nterlab Duplicate	781350	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.31*	0.38	0.44
	MW268	9/06/2021	0089_MW268_210609	Normal	EP2106515	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.28*	0.39	0.48
	MW268	31/08/2021	0089_MW268_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.41*	0.51	0.60
	MW268	11/01/2022	0089_MW268_220111	Normal	EP2200241	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.41*	0.48	0.55
	MW268	17/03/2022	0089_MW268_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.35*	0.47	0.53
	MW268	9/06/2022	0089_MW268_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.41*	0.51	0.58
	MW268	6/09/2022	0089_MW268_220906	Normal	EP2211390	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.58*	0.69	0.77
	MW269	1/08/2017	0089_MW269_S_170801	Normal	198918	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW269	19/09/2017	0089_MW269_S_170919	Normal	176140	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW269	16/10/2017	0089_MW269_S_171016	Normal	177956	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW269	17/11/2017	0089_MW269_S_171117	Normal	203443	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.002	<0.005	<0.1	<0.002	<0.05			
	MW269	7/12/2017	0089_MW269_S_171207	Normal	204323	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW269	16/01/2018	0089_MW269_S_180116	Normal	205631	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW269	19/12/2019	0089_MW269_191219	Normal	EP1913595	<0.05	0.30	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.56*	2.21	2.35
	MW269	30/03/2020	0089_MW269_200330	Normal	EP2003313	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.11*	1.37	1.48
Dredge spoil	MW269	21/07/2020	0089_MW269_200721	Normal	EP2007611	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.82*	1.02	1.12
	MW269	21/09/2020	0089_MW269_200921	Normal	EP2010085	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.04*	1.27	1.37
	MW269	14/12/2020	0089_MW269_201214	Normal	EP2013975	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.65*	0.79	0.85
	MW269	16/03/2021	0089_MW269_210316	Normal	EP2102837	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.07*	1.29	1.39
	MW269	9/06/2021	0089_MW269_210609	Normal	EP2106515	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.05*	1.31	1.44
	MW269	31/08/2021	0089_MW269_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.00*	1.25	1.35
	MW269	11/01/2022	0089_MW269_220111	Normal	EP2200241	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.46*	0.53	0.59
	MW269	17/03/2022	0089_MW269_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.08*	1.31	1.41
	MW269	9/06/2022	0089_MW269_220609	Normal	EP2207028	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.04*	1.23	1.32
	MW269	6/09/2022	0089_MW269_220906	Normal	EP2211390	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.14*	1.37	1.46
	MW282	11/09/2017	0089_MW282_S_170911	Normal	175533	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW282	16/10/2017	0089_MW282_S_171016	Normal	177956	<0.01	0.058	<0.01	<0.02	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<1			
	MW282	17/11/2017	0089_MW282_S_171117	Normal	203443	<0.01	0.049	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5			
	MW282	5/12/2017	0089_MW282_S_171205	Normal	204183	<0.02	0.050	<0.02	<0.02	<0.02	<0.1	<0.04	<0.1	<0.2	<0.04	<1			
	MW282	15/01/2018	0089_MW282_S_180115	Normal	205568	<0.001	0.11	<0.001	<0.001	<0.01	<0.005	<0.002	0.01	<0.01	<0.002	<0.05			
	MW282	19/12/2019	0089_MW282_191219	Normal	EP1913595	<0.05	1.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***243***	278	296
	MW282	19/12/2019	0089_QC101_191219	Field Duplicate	EP1913595	<0.05	0.34	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***170***	210	226
	MW282	31/03/2020	0089_MW282_200331	Normal	EP2003366	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***123***	171	187
Helicopter Support Facility	MW282	22/07/2020	0089_MW282_200722	Normal	EP2007667	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***115***	132	144
	MW282	24/09/2020	0089_MW282_200924	Normal	EP2010273	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***58.6***	73.9	82.7
	MW282	15/12/2020	0089_MW282_201215	Normal	EP2014041	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***85.3***	111	123
	MW282	18/03/2021	0089_MW282_210318	Normal	EP2102955	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***94.0***	122	132
	MW282	9/06/2021	0089_MW282_210609	Normal	EP2106514	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***83.0***	116	127
	MW282	31/08/2021	0089_MW282_210831	Normal	EP2110064	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***79.1***	100	108
	MW282	13/01/2022	0089_MW282_220113	Normal	EP2200339	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***143***	164	188
	MW282	17/03/2022	0089_MW282_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***140***	173	189
	MW282	8/06/2022	0089_MW282_220608	Normal	EP2206971	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***95.0***	107	115
	MW282	8/09/2022	0089_MW282_220908	Normal	EP2211535	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***120***	131	142
	MW288	18/09/2017	0089_MW288_S_170918	Normal	176030	<0.001	0.006	0.008	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW288	17/10/2017	0089_MW288_S_171017	Normal	177985	<0.001	0.007	0.013	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW288	15/11/2017	0089_MW288_S_171115	Normal	203378	<0.001	0.005	0.007	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW288	7/12/2017	0089_MW288_S_171207	Normal	204323	<0.001	0.007	0.013	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW288	15/01/2018	0089_MW288_S_180115	Normal	205568	<0.001	0.006	0.009	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
Accommodation area	MW288	15/07/2020	0089_MW288_200715	Normal	EP2007385	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.1***	13.9	14.2
	MW288	17/03/2021	0089_MW288_210317	Normal	EP2102900	<0.05	<0.05	<0.05	<0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.59***	7.73	8.07
	MW288	31/08/2021	0089_MW288_210831	Normal	EP2110071	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***5.87***		
	MW288	12/01/2022	0089_MW288_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.62***	4.71	4.74
	MW288	18/03/2022	0089_MW288_220318	Normal	EP2203194	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.23***	3.26	3.26
	MW288	8/06/2022	0089_MW288_220608	Normal	EP2206971	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.03***	3.05	3.05
	MW288	6/09/2022	0089_MW288_220906	Normal	EP2211390	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***4.65***	4.65	4.65
	MW289	18/09/2017	0089_MW289_S_170918	Normal	176030	<0.001	<0.001	0.002	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW289	17/10/2017	0089_MW289_S_171017	Normal	177985	<0.001	<0.001	0.001	<0.001	<0.01	<0.03	<0.002	<0.005	<0.05	<0.002	<0.05			
	MW289	15/11/2017	0089_MW289_S_171115	Normal	203378	<0.001	<0.001	0.002	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW289	7/12/2017	0089_MW289_S_171207	Normal	204323	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW289	15/01/2018	0089_MW289_S_180115	Normal	205568	<0.001	<0.001	0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05			
	MW289	30/03/2020	0089_MW289_200330	Normal	EP2003313	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.62*	0.62	0.62
	MW289	22/07/2020	0089_MW289_200722	Normal	EP2007667	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.01*	1.07	1.09
	MW289	21/09/2020	0089_MW289_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***3.08***	3.38	3.55
	MW289	21/09/2020	0089_QC101_200921	Field Duplicate	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.32***	2.59	2.75
Accommodation area	MW289	21/09/2020	0089_QC201_200921	nterlab Duplicate	746269	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***2.12***	2.29	2.4
	MW289	15/12/2020	0089_MW289_201215	Normal	EP2014042	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.72*	1.81	1.89
	MW289	16/03/2021	0089_MW289_210316	Normal	EP2102837	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.97*	0.97	0.97
	MW289	9/06/2021	0089_MW289_210609	Normal	EP2106516	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.52***	2.73	2.85
	MW289	30/08/2021	0089_MW289_210830	Normal	EP2110016	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.01*	1.07	1.11
	MW289	30/08/2021	0089_QC103_210830	Field Duplicate	EP2110016	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.00*	1.06	1.10
	MW289	30/08/2021	0089_QC203_210830	nterlab Duplicate	820919	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	<0.1	<0.05	*0.84*	0.86	0.91
	MW289	13/01/2022	0089_MW289_220113	Normal	EP2200340	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.47*	1.88	2.00
	MW289	17/03/2022	0089_MW289_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.85*	1.31	1.41
	MW289	8/06/2022	0089_MW289_220608	Normal	EP2206969	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.08*	1.63	1.78
	MW289	5/09/2022	0089_MW289_220905	Normal	EP2211345	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.20***	2.45	2.55
	MW500	10/01/2022	0089_MW500_220110	Normal	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***58.7***	62.3	68.4
	MW500	10/01/2022	0089_QC105_220110	Field Duplicate	EP2200214	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***57.8***	61.2	66.6
Fire Training Area	MW500	10/01/2022	0089_QC205_220110	nterlab Duplicate	854607	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***50.9***	52.84	58.84
	MW500	14/03/2022	0089_MW500_220314	Normal	EP2202975	<0.05	0.10	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***56.7***	62.7	66.2
	MW500	7/06/2022	0089_MW500_220607	Normal	EP2206880	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***73.5***	82.9	86.9
	MW500	5/09/2022	0089_MW500_220905	Normal	EP2211343	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***71.1***	75.4	78.3

Table 1 Groundwater Analytical Results

	PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water												*0.07*		
PFAS NEMP 2020 Interim Marine 99%														
PFAS NEMP 2020 Recreational Water												**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**									
AVCAT Storage	MW516	30/03/2020	0089_MW247_200330	Normal	EP2003313	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***14.5***	15.2	15.6
	MW516	21/07/2020	0089_MW247_200721	Normal	EP2007611	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
	MW516	21/09/2020	0089_MW516_200921	Normal	EP2010077	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***13.8***	14.4	14.8
	MW516	16/12/2020	0089_MW516_201216	Normal	EP2014087	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.53***	6.88	7.09
	MW516	18/03/2021	0089_MW516_210318	Normal	EP2102954	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***12.6***	14.2	14.5
	MW516	9/06/2021	0089_MW516_210609	Normal	EP2106515	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.6***	11.0	11.3
	MW516	31/08/2021	0089_MW516_210831	Normal	EP2110073	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.22***	6.49	6.70
	MW516	12/01/2022	0089_MW516_220112	Normal	EP2200288	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***10.6***	10.9	11.0
	MW516	17/03/2022	0089_MW516_220317	Normal	EP2203138	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***9.38***	9.77	9.92
	MW516	8/06/2022	0089_MW516_220608	Normal	EP2206969	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***11.3***	11.6	11.7
	MW516	6/09/2022	0089_MW516_220906	Normal	EP2211389	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***6.21***	6.88	7.31

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Fire Training Area	MW109	8/03/2017	0089_MW109_S_170803	Normal	199045	250				79	3.6		97	20	2.1	39
	MW109	20/09/2017	0089_MW109_D_170920	Normal	176250											
	MW109	20/09/2017	0089_MW109_S_170920	Normal	176250											
	MW109	18/10/2017	0089_MW109_D_171018	Normal	178113											
	MW109	18/10/2017	0089_MW109_S_171018	Normal	178113											
	MW109	16/11/2017	0089_MW109_D_171116	Normal	203411											
	MW109	16/11/2017	0089_MW109_S_171116	Normal	203411											
	MW109	6/12/2017	0089_MW109_D_171206	Normal	204243											
	MW109	6/12/2017	0089_MW109_S_171206	Normal	204243											
	MW109	18/01/2018	0089_MW109_D_180118	Normal	205797											
	MW109	18/01/2018	0089_MW109_S_180118	Normal	205797											
	MW109	16/12/2019	0089_MW109_191216	Normal	EP1913380	297	297	7.99	8.28	56	1.78	23	103	18	2	37
	MW109	30/03/2020	0089_MW109_200330	Normal	EP2003333	361	361	10.7	11.2	108	2.16	23	125	26	2	64
	MW109	15/07/2020	0089_MW109_200715	Normal	EP2007385	319	319	8.62	8.32	64	1.76	21	102	18	2	39
	MW109	15/07/2020	0089_QC105_200715	Field Duplicate	EP2007385	314	314	8.40	8.47	60	0.38	21	105	18	2	39
	MW109	15/07/2020	0089_QC205_200215	nterlab Duplicate	732844	330	330			69						
	MW109	21/09/2020	0089_MW109_200921	Normal	EP2010093	298	298	8.03	7.99	55	0.23	25	98	18	2	36
	MW109	14/12/2020	0089_MW109_201214	Normal	EP2013984	278	278	7.34	7.23	44	0.76	26	89	16	3	32
	MW109	14/12/2020	0089_QC108_201214	Field Duplicate	EP2013984	290	290	7.55	6.98	43	3.89	26	85	16	3	31
	MW109	14/12/2020	0089_QC208_201114	nterlab Duplicate	765054	850	850			70						
	MW109	16/03/2021	0089_MW109_210316	Normal	EP2102833	434	434	15.6	15.1	227	1.54	26	121	45	2	123
	MW109	8/06/2021	0089_MW109_210608	Normal	EP2106448	344	344	10.0	10.1	96	0.62	21	106	24	2	65
	MW109	30/08/2021	0089_MW109_210830	Normal	EP2110020	278	278	8.51	8.58	84	0.43	28	96	19	2	50
	MW109	14/03/2022	0089_MW109_220314	Normal	EP2202975	437	437	15.1	15.8	200	2.00	37	120	51	2	127
	MW109	14/03/2022	0089_QC106_220314	Field Duplicate	EP2202975											
	MW109	14/03/2022	0089_QC206_220314	nterlab Duplicate	872911											
	MW109	7/06/2022	0089_MW109_220607	Normal	EP2206880	354	354	10.5	10.1	107	1.73	18	113	22	2	60
	MW109	7/06/2022	0089_QC107_220607	Field Duplicate	EP2206880											
	MW109	7/06/2022	0089_QC207_220607	nterlab Duplicate	896805											
	MW109	5/09/2022	0089_MW109_220905	Normal	EP2211343	303	303	9.14	9.00	94	0.77	21	92	20	1	63
	MW109	5/09/2022	0089_QC117_220905	Field Duplicate	EP2211343	303	303	9.18	9.10	96	0.45	20	93	20	1	64
	MW109	5/09/2022	0089_QC217_220905	nterlab Duplicate	920981											
Fire Training Area	MW112	30/10/2010	DS3-MB01	Normal	EP1005976											
	MW112	22/10/2013	WA0001_D53_MB01	Normal	EP1308039											
	MW112	26/05/2015	D53_MB01	Normal	EP1510572											
	MW112	29/09/2015	WA0001_MB01	Normal	EP1514335											
	MW112	23/02/2016	D53_MB01	Normal	EP1601568											
	MW112	25/10/2016	D53_MB01	Normal	521581											
	MW112	25/10/2016	QC102	Field Duplicate	521581											
	MW112	25/10/2016	QC202	nterlab Duplicate	521581											
	MW112	8/03/2017	0089_MW112_S_170803	Normal	199045	180				29	6.4		78	8.9	1.3	17
	MW112	20/09/2017	0089_MW112_S_170920	Normal	176250											
	MW112	18/10/2017	0089_MW112_S_171018	Normal	178113											
	MW112	16/11/2017	0089_MW112_S_171116	Normal	203411											
	MW112	6/12/2017	0089_MW112_S_171206	Normal	204243											
	MW112	18/01/2018	0089_MW112_S_180118	Normal	205797											
	MW112	8/01/2020	0089_MW112_200108	Normal	EP2000179	185	185	5.18	5.88	37	6.34	21	83	10	<1	21
	MW112	30/03/2020	0089_MW112_200330	Normal	EP2003333	187	187	5.04	5.77	36	6.72	14	79	9	<1	25
	MW112	30/03/2020	0089_QC102_200330	Field Duplicate	EP2003333	184	184	5.22	6.05	40	7.33	20	85	10	1	22
	MW112	30/03/2020	0089_QC202_200330	nterlab Duplicate	711144	200	200			61						
	MW112	15/07/2020	0089_MW112_200715	Normal	EP2007385	315	315	8.41	7.03	41	8.92	46	97	13	3	24
	MW112	21/09/2020	0089_MW112_200921	Normal	EP2010093	219	219	5.73	5.79	31	0.50	23	79	11	1	21
	MW112	14/12/2020	0089_MW112_201214	Normal	EP2013984	241	241	6.32	5.47	34	7.14	26	73	10	2	22
	MW112	16/03/2021	0089_MW112_210316	Normal	EP2102833	211	211	6.02	6.54	38	4.19	35	88	12	3	25
	MW112	16/03/2021	0089_QC112_210316	Field Duplicate	EP2102833	213	213	5.96	6.42	37	3.70	32	87	12	2	24
	MW112	16/03/2021	0089_QC212_210316	nterlab Duplicate	781350	320				49						
	MW112	8/06/2021	0089_MW112_210608	Normal	EP2106448	228	228	6.13	6.15	33	0.14	31	84	11	2	23
	MW112	30/08/2021	0089_MW112_210830	Normal	EP2110020	222	222	5.73	5.77	32	0.29	19	82	10	1	19
	MW112	10/01/2022	0089_MW112_220110	Normal	EP2200214	226	226	5.71	4.83	32	8.38	14	66	7	<1	22
	MW112	14/03/2022	0089_MW112_220314	Normal	EP2202975	205	205	5.24	5.38	28	1.36	17	73	9	<1	23
	MW112	14/03/2022	0089_QC105_220314	Field Duplicate	EP2202975											
	MW112	14/03/2022	0089_QC205_220314	nterlab Duplicate	872911											
	MW112	7/06/2022	0089_MW112_220607	Normal	EP2206880	218	218	5.31	5.05	25	2.53	12	75	9	<1	13
	MW112	7/06/2022	0089_QC105_220607	Field Duplicate	EP2206880											
	MW112	7/06/2022	0089_QC205_220607	nterlab Duplicate	896805											
	MW112	5/09/2022	0089_MW112_220905	Normal	EP2211343	219	219	5.28	4.89	26	3.83	8	70	9	<1	15

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Fire Training Area	MW120	8/03/2017	0089_MW120_S_170803	Normal	199045	230				58	4		80	23	2.2	28
	MW120	20/09/2017	0089_MW120_D_170920	Normal	176250											
	MW120	20/09/2017	0089_MW120_S_170920	Normal	176250											
	MW120	18/10/2017	0089_MW120_D_171018	Normal	178113											
	MW120	18/10/2017	0089_MW120_S_171018	Normal	178113											
	MW120	16/11/2017	0089_MW120_D_171116	Normal	203411											
	MW120	16/11/2017	0089_MW120_S_171116	Normal	203411											
	MW120	6/12/2017	0089_MW120_D_171206	Normal	204243											
	MW120	6/12/2017	0089_MW120_S_171206	Normal	204243											
	MW120	18/01/2018	0089_MW120_D_180118	Normal	205797											
	MW120	18/01/2018	0089_MW120_S_180118	Normal	205797											
	MW120	16/12/2019	0089_MW120_191216	Normal	EP1913380	262	262	6.64	7.02	35	2.76	20	84	17	3	31
	MW120	30/03/2020	0089_MW120_200330	Normal	EP2003333	221	221	5.98	7.24	40	9.50	21	86	19	3	30
	MW120	15/07/2020	0089_MW120_200715	Normal	EP2007385	245	245	6.53	6.78	41	1.92	23	82	17	3	28
	MW120	15/07/2020	0089_QC106_200715	Field Duplicate	EP2007385	250	250	6.63	6.68	41	0.36	23	82	16	2	28
	MW120	15/07/2020	0089_QC206_200215	nterlab Duplicate	732844	290	290			39						
	MW120	14/12/2020	0089_MW120_201214	Normal	EP2013984	228	228	6.06	5.92	37	1.18	22	67	15	3	29
	MW120	16/03/2021	0089_MW120_210316	Normal	EP2102833	236	236	6.22	6.67	38	3.48	21	78	17	3	30
	MW120	8/06/2021	0089_MW120_210608	Normal	EP2106448	235	235	6.26	6.73	40	3.61	21	80	17	3	29
	MW120	30/08/2021	0089_MW120_210830	Normal	EP2110020	240	240	6.57	6.88	46	2.30	23	78	19	3	31
	MW120	10/01/2022	0089_MW120_220110	Normal	EP2200214	258	258	7.05	6.10	51	7.26	22	72	15	2	28
	MW120	10/01/2022	0089_QC104_220110	Field Duplicate	EP2200214											
	MW120	10/01/2022	0089_QC204_220110	nterlab Duplicate	854607											
	MW120	14/03/2022	0089_MW120_220314	Normal	EP2202975	232	232	6.26	6.46	42	1.60	21	78	16	3	27
	MW120	14/03/2022	0089_QC104_220314	Field Duplicate	EP2202975											
	MW120	14/03/2022	0089_QC204_220314	nterlab Duplicate	872911											
	MW120	7/06/2022	0089_MW120_220607	Normal	EP2206880	258	258	6.85	6.77	44	0.64	22	79	17	3	31
	MW120	5/09/2022	0089_MW120_220905	Normal	EP2211343	252	252	6.85	6.63	51	1.62	18	72	18	3	34
	MW120	5/09/2022	0089_QC116_220905	Field Duplicate	EP2211343	260	260	7.10	6.68	52	3.04	21	73	18	3	34
	MW120	5/09/2022	0089_QC216_220905	nterlab Duplicate	920981											
Fire Training Area	MW121	23/02/2016	D53_MB03A	Normal	EP1601568											
	MW121	25/10/2016	D53_MB03A	Normal	521581											
	MW121	8/03/2017	0089_MW121_S_170803	Normal	199045	240				25	5.3		92	14	1.2	15
	MW121	20/09/2017	0089_MW121_D_170920	Normal	176250											
	MW121	20/09/2017	0089_MW121_S_170920	Normal	176250											
	MW121	18/10/2017	0089_MW121_D_171018	Normal	178113											
	MW121	18/10/2017	0089_MW121_S_171018	Normal	178113											
	MW121	16/11/2017	0089_MW121_D_171116	Normal	203411											
	MW121	16/11/2017	0089_MW121_S_171116	Normal	203411											
	MW121	6/12/2017	0089_MW121_D_171206	Normal	204243											
	MW121	6/12/2017	0089_MW121_S_171206	Normal	204243											
	MW121	18/01/2018	0089_MW121_D_180118	Normal	205797											
	MW121	18/01/2018	0089_MW121_S_180118	Normal	205797											
	MW121	16/12/2019	0089_MW121_191216	Normal	EP1913380	245	245	5.57	5.53	15	0.37	12	76	12	2	16
	MW121	30/03/2020	0089_MW121_200330	Normal	EP2003333	204	204	5.60	6.93	40	10.6	19	87	14	5	30
	MW121	15/07/2020	0089_MW121_200715	Normal	EP2007385	226	226	6.55	6.98	50	3.20	30	91	15	3	26
	MW121	21/09/2020	0089_MW121_200921	Normal	EP2010093	241	241	6.56	6.90	44	2.54	24	86	17	3	26
	MW121	14/12/2020	0089_MW121_201214	Normal	EP2013992	235	235	6.37	7.29	44	6.71	21	95	16	4	26
	MW121	16/03/2021	0089_MW121_210316	Normal	EP2102833	211	211	5.74	6.75	40	8.06	19	84	15	4	28
	MW121	8/06/2021	0089_MW121_210608	Normal	EP2106448	218	218	6.40	7.10	54	5.16	25	89	16	3	29
	MW121	30/08/2021	0089_MW121_210830	Normal	EP2110020	229	229	6.03	5.80	39	1.95	17	69	11	4	31
	MW121	10/01/2022	0089_MW121_220110	Normal	EP2200214	257	257	5.84	5.16	17	6.22	11	66	12	2	19
	MW121	14/03/2022	0089_MW121_220314	Normal	EP2202975	270	270	6.28	5.56	24	6.03	10	76	13	2	15
	MW121	14/03/2022	0089_QC102_220314	Field Duplicate	EP2202975											
	MW121	14/03/2022	0089_QC202_220314	nterlab Duplicate	872911											
	MW121	7/06/2022	0089_MW121_220607	Normal	EP2206880	294	294	8.14	7.35	70	5.11	14	97	14	2	30
	MW121	7/06/2022	0089_QC101_220607	Field Duplicate	EP2206880											
	MW121	7/06/2022	0089_QC201_220607	nterlab Duplicate	896805											
	MW121	5/09/2022	0089_MW121_220905	Normal	EP2211343	252	252	5.93	4.98	25	8.72	9	66	10	3	18
Fire Training Area	MW123	8/03/2017	0089_MW123_S_170803	Normal	199045	240				33	1.4		73	15	2.2	25
	MW123	20/09/2017	0089_MW123_D_170920	Normal	176250											
	MW123	20/09/2017	0089_MW123_S_170920	Normal	176250											
	MW123	18/10/2017	0089_MW123_D_171018	Normal	178113											
	MW123	18/10/2017	0089_MW123_S_171018	Normal	178113											
	MW123	16/11/2017	0089_MW123_D_171116	Normal	203411											
	MW123	16/11/2017	0089_MW123_S_171116	Normal	203411											
	MW123	6/12/2017	0089_MW123_D_171206	Normal	204243											
	MW123	6/12/2017	0089_MW123_S_171206	Normal	204243											
	MW123	18/01/2018	0089_MW123_D_180118	Normal	205797											
	MW123	18/01/2018	0089_MW123_S_180118	Normal	205797											
	MW123	16/12/2019	0089_MW123_191216	Normal	EP1913380	354	354	8.06	6.91	29	7.69	8	90	13	5	28
	MW123	16/12/2019	0089_QC101_191216	Field Duplicate	EP1913380	296	296	6.91	7.13	30	1.61	7	92	14	5	29
	MW123	16/12/2019	0089_QC201_191216	nterlab Duplicate	694635	1,900				99						
	MW123	18/12/2019	0089_QC201_191218	nterlab Duplicate	695528	450				630						
	MW123	14/12/2020	0089_MW123_201214	Normal	EP2013992	231	231	15.5	14.9	354	2.13	44	97	32	12	163
	MW123	16/03/2021	0089_MW123_210316	Normal	EP2102833	191	191	5.29	5.72	47	3.96	7	74	10	3	26
	MW123	16/03/2021	0089_QC108_210316	Field Duplicate	EP2102833	218	218	5.88	5.77	48	0.94	8	74	10	3	27
	MW123	16/03/2021	0089_QC208_210316	nterlab Duplicate	781350	670				64						
	MW123	8/06/2021	0089_MW123_210608	Normal	EP2106448	334	334	9.28	8.47	88	4.56	6	94	17	3	53
	MW123	8/06/2021	0089_QC102_210608	Field Duplicate	EP2106448	346	346	9.70	9.05	95	3.43	5	98	19	3	58
	MW123	8/06/2021	0089_QC202_210608	nterlab Duplicate	802464	980				99						
	MW123	30/08/2021	0089_MW123_210830	Normal	EP2110020	261	261	7.39	7.23	69	1.06	11	86	14	2	40
	MW123	10/01/2022	0089_MW123_220110	Normal	EP2200214	293	293	8.15	7.32	77	5.33	6	75	15	<1	54
	MW123	10/01/2022	0089_QC101_220110	Field Duplicate	EP2200214											

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
	MW123	10/01/2022	0089_QC201_220110	Interlab Duplicate	854607											
	MW123	14/03/2022	0089_MW123_220314	Normal	EP2202975	434	434	17.3	16.7	299	1.86	9	103	51	4	166
	MW123	7/06/2022	0089_MW123_220607	Normal	EP2206880	410	410	12.8	12.1	158	2.78	6	109	30	5	93
	MW123	5/09/2022	0089_MW123_220905	Normal	EP2211343	410	410	13.3	12.4	179	3.49	5	100	33	5	106
	MW123	5/09/2022	0089_QC114_220905	Field Duplicate	EP2211343	383	383	12.3	11.7	159	2.43	7	101	30	4	94
	MW123	5/09/2022	0089_QC214_220905	Interlab Duplicate	920981											
	MW124	8/03/2017	0089_MW124_S_170803	Normal	199045	420				14,000	0.84		440	990	260	8,000
	MW124	20/09/2017	0089_MW124_D_170920	Normal	176250											
	MW124	20/09/2017	0089_MW124_S_170920	Normal	176250											
	MW124	18/10/2017	0089_MW124_D_171018	Normal	178113											
	MW124	18/10/2017	0089_MW124_S_171018	Normal	178113											
	MW124	16/11/2017	0089_MW124_D_171116	Normal	203411											
	MW124	16/11/2017	0089_MW124_S_171116	Normal	203411											
	MW124	6/12/2017	0089_MW124_D_171206	Normal	204243											
	MW124	6/12/2017	0089_MW124_S_171206	Normal	204243											
	MW124	18/01/2018	0089_MW124_D_180118	Normal	205797											
	MW124	18/01/2018	0089_MW124_S_180118	Normal	205797											
	MW124	9/01/2020	0089_MW124_200109	Normal	EP2000249	328	328	473	554	15,100	7.86	1,950	544	1,260	468	9,450
	MW124	9/01/2020	0089_QC101_200109	Field Duplicate	EP2000249	332	332	470	554	15,000	8.24	1,910	541	1,250	473	9,470
Fire Training Area	MW124	9/01/2020	0089_QC201_200109	Interlab Duplicate	696324	220				17,000						
	MW124	30/03/2020	0089_MW124_200330	Normal	EP2003333	308	308	484	536	15,400	5.02	2,110	510	1,320	483	8,950
	MW124	15/07/2020	0089_MW124_200715	Normal	EP2007382	206	206	574	652	18,300	6.34	2,580	501	1,410	581	11,400
	MW124	22/09/2020	0089_MW124_200922	Normal	EP2010151	419	419	522	546	16,600	2.20	2,190	502	1,250	487	9,320
	MW124	14/12/2020	0089_MW124_201214	Normal	EP2013984	359	359	504	544	16,000	3.85	2,170	516	1,280	498	9,200
	MW124	15/03/2021	0089_MW124_210315	Normal	EP2102752	324	324	497	531	15,800	3.31	2,160	482	1,210	459	9,100
	MW124	8/06/2021	0089_MW124_210608	Normal	EP2106448	360	360	462	482	14,700	2.14	1,920	447	1,110	459	8,200
	MW124	30/08/2021	0089_MW124_210830	Normal	EP2110019	390	390	432	490	13,800	6.27	1,700	440	1,120	405	8,410
	MW124	10/01/2022	0089_MW124_220110	Normal	EP2200216	536	536	432	466	13,700	3.80	1,680	434	1,030	395	8,040
	MW124	14/03/2022	0089_MW124_220314	Normal	EP2202976	343	343	470	481	15,000	1.16	1,900	457	1,130	420	8,140
	MW124	7/06/2022	0089_MW124_220607	Normal	EP2206880	343	343	449	403	14,300	5.34	1,860	431	970	382	6,720
	MW124	5/09/2022	0089_MW124_220905	Normal	EP2211345	416	416	470	488	15,000	1.87	1,840	450	1,110	433	8,340
	MW124	5/09/2022	0089_QC102_220905	Field Duplicate	EP2211345	408	408	461	483	14,700	2.31	1,840	444	1,110	431	8,240
	MW124	5/09/2022	0089_QC202_220905	Interlab Duplicate	920981											
	MW125	8/03/2017	0089_MW125_S_170803	Normal	199045	420				15,000	-0.59		410	1,000	270	8,200
	MW125	20/09/2017	0089_MW125_D_170920	Normal	176250											
	MW125	20/09/2017	0089_MW125_S_170920	Normal	176250											
	MW125	18/10/2017	0089_MW125_D_171018	Normal	178113											
	MW125	18/10/2017	0089_MW125_S_171018	Normal	178113											
	MW125	18/10/2017	0089_QC1MW_171018	Field Duplicate	178113											
	MW125	18/10/2017	0089_QC2MW_171018	Interlab Duplicate	568770											
	MW125	16/11/2017	0089_MW125_D_171116	Normal	203411											
	MW125	16/11/2017	0089_MW125_S_171116	Normal	203411											
	MW125	6/12/2017	0089_MW125_D_171206	Normal	204243											
	MW125	6/12/2017	0089_MW125_S_171206	Normal	204243											
	MW125	18/01/2018	0089_MW125_D_180118	Normal	205797											
	MW125	18/01/2018	0089_MW125_S_180118	Normal	205797											
	MW125	18/01/2018	0089_QC1MW_180118	Field Duplicate	205797											
	MW125	18/01/2018	0089_QC2MW_180118	Interlab Duplicate	581139											
Fire Training Area	MW125	18/01/2018	0089_QC2MW_180118	Interlab Duplicate	581139											
	MW125	9/01/2020	0089_MW125_200109	Normal	EP2000249	310	310	487	585	15,500	9.16	2,100	552	1,360	498	9,960
	MW125	30/03/2020	0089_MW125_200330	Normal	EP2003333	504	504	511	609	16,100	8.68	2,270	591	1,530	549	10,100
	MW125	15/07/2020	0089_MW125_200715	Normal	EP2007382	288	288	568	667	18,100	8.03	2,480	560	1,450	596	11,600
	MW125	22/09/2020	0089_MW125_200922	Normal	EP2010151	329	329	525	551	16,700	2.40	2,270	492	1,280	504	9,380
	MW125	14/12/2020	0089_MW125_201214	Normal	EP2013984	342	342	507	578	16,100	6.60	2,200	536	1,380	531	9,760
	MW125	15/03/2021	0089_MW125_210315	Normal	EP2102752	448	448	533	586	16,900	4.68	2,290	542	1,350	508	9,990
	MW125	8/06/2021	0089_MW125_210608	Normal	EP2106448	407	407	484	516	15,400	3.27	1,980	471	1,200	499	8,770
	MW125	30/08/2021	0089_MW125_210830	Normal	EP2110019	441	441	477	554	15,200	7.51	1,890	476	1,300	459	9,470
	MW125	30/08/2021	0089_QC101_210830	Field Duplicate	EP2110019	416	416	453	539	14,400	8.68	1,850	469	1,260	448	9,210
	MW125	30/08/2021	0089_QC201_210830	Interlab Duplicate	820919											
	MW125	10/01/2022	0089_MW125_220110	Normal	EP2200216	382	382	419	420	13,300	0.17	1,730	401	948	354	7,200
	MW125	14/03/2022	0089_MW125_220314	Normal	EP2202976	417	417	504	504	16,100	0.04	2,000	473	1,210	439	8,490
	MW125	14/03/2022	0089_QC103_220314	Field Duplicate	EP2202976	415	415	486	519	15,500	3.21	1,960	497	1,240	453	8,740
	MW125	14/03/2022	0089_QC203_220314	Interlab Duplicate	872911											
	MW125	7/06/2022	0089_MW125_220607	Normal	EP2206880	587	587	498	450	15,800	5.03	1,930	476	1,100	420	7,470
	MW125	5/09/2022	0089_MW125_220905	Normal	EP2211345	433	433	483	518	15,400	3.58	1,900	466	1,220	469	8,800
	MW126	8/03/2017	0089_MW126_S_170803	Normal	199045	610				15,000	-0.87		400	1,000	250	7,900
	MW126	20/09/2017	0089_MW126_D_170920	Normal	176250											
	MW126	20/09/2017	0089_MW126_S_170920	Normal	176250											
	MW126	18/10/2017	0089_MW126_D_171018	Normal	178113											
	MW126	18/10/2017	0089_MW126_S_171018	Normal	178113											
	MW126	16/11/2017	0089_MW126_D_171116	Normal	203411											
	MW126	16/11/2017	0089_MW126_S_171116	Normal	203411											
	MW126	6/12/2017	0089_MW126_D_171206	Normal	204243											
	MW126	6/12/2017	0089_MW126_S_171206	Normal	204243											
	MW126	18/01/2018	0089_MW126_D_180118	Normal	205797											
	MW126	18/01/2018	0089_MW126_S_180118	Normal	205797											
Fire Training Area	MW126	8/01/2020	0089_MW126_200108	Normal	EP2000179	502	502	499	520	16,000	2.05	1,800	469	1,240	467	8,790
	MW126	31/03/2020	0089_MW126_200331	Normal	EP2003364	478	478	462	536	14,600	7.46	1,950	547	1,360	464	8,860
	MW126	15/07/2020	0089_MW126_200715	Normal	EP2007382	346	346	524	579	16,700	5.07	2,190	539	1,280	480	10,000
	MW126	22/09/2020	0089_MW126_200922	Normal	EP2010151	443	443	495	552	15,800	5.40	1,960	511	1,310	482	9,340
	MW126	14/12/2020	0089_MW126_201214	Normal	EP2013984	485	485	472	522	15,000	5.08	1,860	505	1,290	461	8,710
	MW126	15/03/2021	0089_MW126_210315	Normal	EP2102752	400	400	499	541	15,900	4.00	2,040	506	1,280	453	9,160
	MW126	8/06/2021	0089_MW126_210608	Normal	EP2106448	444	444	448	485	14,200	3.95	1,870	451	1,160	448	8,180
	MW126	30/08/2021	0089_MW126_210830	Normal	EP2110019	594	594	448	506	14,300	5.99	1,600	454	1,220	403	8,560

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
	MW126	10/01/2022	0089_MW126_220110	Normal	EP2200211	639	639	444	451	14,100	0.78	1,590	419	1,050	361	7,680
	MW126	14/03/2022	0089_MW126_220314	Normal	EP2202976	616	616	484	471	15,500	1.38	1,660	444	1,160	394	7,890
	MW126	7/06/2022	0089_MW126_220607	Normal	EP2206880	546	546	493	406	15,800	9.64	1,740	436	1,020	369	6,690
	MW126	5/09/2022	0089_MW126_220905	Normal	EP2211345	682	682	477	465	15,400	1.30	1,400	408	1,130	397	7,850
Fire Training Area	MW127	8/03/2017	0089_MW127_S_170803	Normal	199045	630				13,000	-0.38		320	910	220	6,800
	MW127	8/03/2017	0089_QC1MW_S_170803	Field Duplicate	199045	630				13,000	-0.53		300	870	210	7,000
	MW127	4/08/2017	0089_QC2MW_170803	Interlab Duplicate	557474	650				14,000						
	MW127	20/09/2017	0089_MW127_S_170920	Normal	176250											
	MW127	18/10/2017	0089_MW127_S_171018	Normal	178113											
	MW127	16/11/2017	0089_MW127_S_171116	Normal	203411											
	MW127	16/11/2017	0089_QC1MW_171116	Field Duplicate	203411											
	MW127	16/11/2017	0089_QC2MW_171116	Interlab Duplicate	573296											
	MW127	6/12/2017	0089_MW127_S_171206	Normal	204243											
	MW127	18/01/2018	0089_MW127_S_180118	Normal	205797											
	MW127	8/01/2020	0089_MW127_200108	Normal	EP2000179	483	483	438	459	14,000	2.40	1,600	394	1,120	408	7,750
	MW127	31/03/2020	0089_MW127_200331	Normal	EP2003364	471	471	445	520	14,100	7.74	1,840	457	1,360	461	8,590
	MW127	31/03/2020	0089_QC104_200331	Field Duplicate	EP2003364	474	474	443	491	14,000	5.19	1,840	433	1,280	431	8,120
	MW127	31/03/2020	0089_QC204_200331	Interlab Duplicate	711434	370	370			16,000						
	MW127	15/07/2020	0089_MW127_200715	Normal	EP2007382	510	510	447	461	14,200	1.61	1,730	411	1,110	368	7,820
	MW127	22/09/2020	0089_MW127_200922	Normal	EP2010151	488	488	470	517	15,000	4.72	1,790	433	1,270	440	8,720
	MW127	14/12/2020	0089_MW127_201214	Normal	EP2013984	470	470	465	528	14,800	6.26	1,850	467	1,320	470	8,820
	MW127	15/03/2021	0089_MW127_210315	Normal	EP2102752	438	438	460	508	14,600	4.88	1,920	432	1,230	431	8,600
	MW127	8/06/2021	0089_MW127_210608	Normal	EP2106448	478	478	447	471	14,200	2.63	1,770	398	1,150	440	7,940
	MW127	30/08/2021	0089_MW127_210830	Normal	EP2110019	559	559	429	489	13,600	6.50	1,640	408	1,190	398	8,280
	MW127	10/01/2022	0089_MW127_220110	Normal	EP2200211	486	486	383	391	12,100	1.08	1,530	364	931	315	6,630
	MW127	14/03/2022	0089_MW127_220314	Normal	EP2202976	488	488	433	413	13,800	2.30	1,620	385	1,050	345	6,870
	MW127	7/06/2022	0089_MW127_220607	Normal	EP2206880	498	498	453	397	14,400	6.52	1,760	401	1,010	364	6,550
	MW127	5/09/2022	0089_MW127_220905	Normal	EP2211345	509	509	443	431	14,200	1.36	1,550	383	1,070	369	7,230
	MW127	5/09/2022	0089_QC113_220905	Field Duplicate	EP2211345	509	509	420	466	13,400	5.13	1,550	411	1,160	400	7,810
	MW127	5/09/2022	0089_QC213_220905	Interlab Duplicate	920981											
Fire Training Area	MW128	8/03/2017	0089_MW128_S_170803	Normal	199045	310				28	3.6		100	18	4.9	32
	MW128	20/09/2017	0089_MW128_D_170920	Normal	176250											
	MW128	20/09/2017	0089_MW128_S_170920	Normal	176250											
	MW128	20/09/2017	0089_QC1MW_170920	Field Duplicate	176250											
	MW128	20/09/2017	0089_QC2MW_170920	Interlab Duplicate	564343											
	MW128	18/10/2017	0089_MW128_D_171018	Normal	178113											
	MW128	18/10/2017	0089_MW128_S_171018	Normal	178113											
	MW128	16/11/2017	0089_MW128_D_171116	Normal	203411											
	MW128	16/11/2017	0089_MW128_S_171116	Normal	203411											
	MW128	6/12/2017	0089_MW128_D_171206	Normal	204243											
	MW128	6/12/2017	0089_MW128_S_171206	Normal	204243											
	MW128	6/12/2017	0089_QC1MW_171206	Field Duplicate	204243											
	MW128	6/12/2017	0089_QC2MW_171206	Interlab Duplicate	576599											
	MW128	18/01/2018	0089_MW128_D_180118	Normal	205797											
	MW128	18/01/2018	0089_MW128_S_180118	Normal	205797											
	MW128	8/06/2022	0089_MW128_220608	Normal	EP2206971	462	462	10.7	9.63	41	5.47	17	106	30	5	40
	MW128	5/09/2022	0089_MW128_220905	Normal	EP2211343	326	326	8.32	7.92	45	2.47	26	68	26	5	52
	MW139	30/10/2010	C24-MB01	Normal	EP1005976											
	MW139	18/10/2013	WA0006_C24_MB01	Normal	EP1307981											
	MW139	26/05/2015	C24_MB01	Normal	EP1510572											
	MW139	29/09/2015	C24_MB01	Normal	EP1514335											
	MW139	25/10/2016	C24_MB01	Normal	521581											
	MW139	1/08/2017	0089_MW139_S_170801	Normal	198918	200				37	6.3		81	12	2.0	27
	MW139	19/09/2017	0089_MW139_D_170919	Normal	176140											
	MW139	19/09/2017	0089_MW139_S_170919	Normal	176140											
	MW139	17/10/2017	0089_MW139_D_171017	Normal	177985											
	MW139	17/10/2017	0089_MW139_S_171017	Normal	177985											

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Demolition Ground	MW139	20/11/2017	0089_MW139_D_171120	Normal	203545											
	MW139	20/11/2017	0089_MW139_S_171120	Normal	203545											
	MW139	4/12/2017	0089_MW139_D_171204	Normal	204124											
	MW139	4/12/2017	0089_MW139_S_171204	Normal	204124											
	MW139	17/01/2018	0089_MW139_D_1801117	Normal	205691											
	MW139	17/01/2018	0089_MW139_S_1801117	Normal	205691											
	MW139	1/02/2018	0089_MW139_D_180201	Normal	206292	160				27	9.0		72	8.4	1.4	18
	MW139	1/02/2018	0089_MW139_I_180201	Normal	206292	160				25	9.0		71	8.4	1.4	17
	MW139	1/02/2018	0089_MW139_S_180201	Normal	206292	160				27	8.7		69	8.8	1.5	19
	MW139	1/02/2018	0089_QC6MW_180201	Field Duplicate	206292	160				34	6.7		72	8.6	1.9	18
	MW139	1/02/2018	0089_QC7MW_180201	nterlab Duplicate	582979	120	120			45						
	MW139	8/01/2020	0089_MW139_200108	Normal	EP2000179	207	207	46.3	49.5	1,400	3.26	130	152	104	39	743
	MW139	8/01/2020	0089_QC101_200108	Field Duplicate	EP2000179	206	206	47.3	50.0	1,430	2.79	136	153	106	40	750
	MW139	8/01/2020	0089_QC201_200108	nterlab Duplicate	696100	240				2,200						
	MW139	30/03/2020	0089_MW139_200330	Normal	EP2003308	262	262	102	107	3,200	2.68	300	204	249	90	1,710
	MW139	20/07/2020	0089_MW139_200720	Normal	EP2007544	302	302	142	155	4,440	4.23	521	206	376	116	2,540
	MW139	22/09/2020	0089_MW139_200922	Normal	EP2010151	198	198	58.8	56.9	1,770	1.69	238	134	134	45	874
	MW139	14/12/2020	0089_MW139_201214	Normal	EP2013983	258	258	118	113	3,670	2.04	447	214	283	90	1,770
	MW139	16/03/2021	0089_MW139_210316	Normal	EP2102837	272	272	71.3	71.8	2,180	0.36	210	165	161	63	1,120
	MW139	8/06/2021	0089_MW139_210608	Normal	EP2106464	155	155	34.1	33.6	993	0.70	145	106	80	25	486
	MW139	8/06/2021	0089_QC101_210608	Field Duplicate	EP2106464	174	174	36.0	36.3	1,040	0.31	155	102	87	29	535
	MW139	8/06/2021	0089_QC201_210608	nterlab Duplicate	802464	190				2,100						
	MW139	31/08/2021	0089_MW139_210831	Normal	EP2110071	149	149	4.47	4.87	41	4.35	16	66	8	2	20
	MW139	10/01/2022	0089_MW139_220110	Normal	EP2200214	147	147	4.43	4.17	39	3.10	19	50	7	2	24
	MW139	15/03/2022	0089_MW139_220315	Normal	EP2203018	278	278	104	110	3,230	2.84	365	220	241	100	1,770
	MW139	8/06/2022	0089_MW139_220608	Normal	EP2206969	312	312	129	119	4,020	3.93	448	208	316	92	1,850
	MW139	5/09/2022	0089_MW139_220905	Normal	EP2211343	173	173	21.6	21.5	595	0.24	66	82	50	15	297
	MW141	30/10/2010	C24-MBO3	Normal	EP1005976											
	MW141	18/10/2013	WA0006_C24_MB03	Normal	EP1307981											
	MW141	26/05/2015	C24_MB03	Normal	EP1510572											
	MW141	29/09/2015	C24_MB03	Normal	EP1514335											
	MW141	25/10/2016	C24_MB03	Normal	521581											
	MW141	1/08/2017	0089_MW141_S_170801	Normal	198918	420				4,900	2.8		260	330	96	2,900
	MW141	19/09/2017	0089_MW141_D_170919	Normal	176140											
	MW141	19/09/2017	0089_MW141_S_170919	Normal	176140											
	MW141	19/09/2017	0089_QC1MW_170919	Field Duplicate	176140											
	MW141	19/09/2017	0089_QC2MW_170919	nterlab Duplicate	564343											
	MW141	17/10/2017	0089_MW141_D_171017	Normal	177985											
	MW141	17/10/2017	0089_MW141_S_171017	Normal	177985											
	MW141	20/11/2017	0089_MW141_D_171120	Normal	203545											
	MW141	20/11/2017	0089_MW141_S_171120	Normal	203545											
	MW141	4/12/2017	0089_MW141_D_171204	Normal	204124											
	MW141	4/12/2017	0089_MW141_S_171204	Normal	204124											
	MW141	17/01/2018	0089_MW141_D_1801117	Normal	205691											
	MW141	17/01/2018	0089_MW141_S_1801117	Normal	205691											
	MW141	1/02/2018	0089_MW141_D_180201	Normal	206292	400				6,700	3.7		270	470	130	4,000
	MW141	1/02/2018	0089_MW141_I_180201	Normal	206292	400				7,100	-0.72		270	460	130	3,800
	MW141	1/02/2018	0089_MW141_S_180201	Normal	206292	410				4,500	-0.93		240	300	86	2,400
	MW141	8/01/2020	0089_MW141_200108	Normal	EP2000179	423	423	230	230	7,220	0.13	866	334	521	184	3,800
	MW141	30/03/2020	0089_MW141_200330	Normal	EP2003308	388	388	336	337	10,700	0.08	1,290	426	797	306	5,570
	MW141	20/07/2020	0089_MW141_200720	Normal	EP2007544	374	374	340	385	10,700	6.14	1,500	374	858	309	6,620
	MW141	23/09/2020	0089_MW141_200923	Normal	EP2010220	393	393	310	306	9,800	0.65	1,220	382	700	282	5,100
	MW141	14/12/2020	0089_MW141_201214	Normal	EP2013975	346	346	304	315	9,590	1.78	1,260	396	732	280	5,230
	MW141	16/03/2021	0089_MW141_210316	Normal	EP2102837	340	340	362	404	11,400	5.42	1,630	432	907	363	6,860
	MW141	8/06/2021	0089_MW141_210608	Normal	EP2106464	400	400	346	350	11,000	0.62	1,320	396	784	323	5,920
	MW141	31/08/2021	0089_MW141_210831	Normal	EP2110071	466	466	257	263	8,060	1.06	994	368	577	203	4,410
	MW141	10/01/2022	0089_MW141_220110	Normal	EP2200214	494	494	218	204	6,790	3.46	825	337	412	141	3,440
	MW141	10/01/2022	0089_QC112_220110	Field Duplicate	EP2200214											
	MW141	10/01/2022	0089_QC212_220110	nterlab Duplicate	854607											
	MW141	15/03/2022	0089_MW141_220315	Normal	EP2203018	386	386	306	312	9,690	0.90	1,200	400	717	268	5,190
	MW141	8/06/2022	0089_MW141_220608	Normal	EP2206969	383	383	322	354	10,100	4.63	1,430	410	863	318	5,840
	MW141	5/09/2022	0089_MW141_220905	Normal	EP2211343	475	475	265	258	8,390	1.39	923	412	607	209	4,190
	MW141	5/09/2022	0089_QC101_220905	Field Duplicate	EP2211343	600	600	287	287	9,060	0.05	933	396	679	241	4,710
	MW141	5/09/2022	0089_QC201_220905	nterlab Duplicate	920981											

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Demolition Ground	MW142	1/08/2017	0089_MW142_S_170801	Normal	198918	330				4,000	1.6		140	290	85	2,400
	MW142	19/09/2017	0089_MW142_D_170919	Normal	176140											
	MW142	19/09/2017	0089_MW142_S_170919	Normal	176140											
	MW142	17/10/2017	0089_MW142_D_171017	Normal	177985											
	MW142	17/10/2017	0089_MW142_S_171017	Normal	177985											
	MW142	17/10/2017	0089_QC1MW_171017	Field Duplicate	177985											
	MW142	17/10/2017	0089_QC2MW_171017	Interlab Duplicate	568770											
	MW142	20/11/2017	0089_MW142_D_171120	Normal	203545											
	MW142	20/11/2017	0089_MW142_S_171120	Normal	203545											
	MW142	20/11/2017	0089_QC1MW_171120	Field Duplicate	203545											
	MW142	20/11/2017	0089_QC2MW_171120	Interlab Duplicate	573488											
	MW142	4/12/2017	0089_MW142_D_171204	Normal	204124											
	MW142	4/12/2017	0089_MW142_S_171204	Normal	204124											
	MW142	4/12/2017	0089_QC1MW_171204	Field Duplicate	204124											
	MW142	4/12/2017	0089_QC2MW_171204	Interlab Duplicate	576083											
	MW142	17/01/2018	0089_MW142_D_1801117	Normal	205691											
	MW142	17/01/2018	0089_MW142_S_1801117	Normal	205691											
	MW142	1/02/2018	0089_MW142_D_180201	Normal	206292	280				10,000	0.83		270	700	210	5,800
	MW142	1/02/2018	0089_MW142_I_180201	Normal	206292	300				8,700	-1.2		230	580	160	4,800
	MW142	1/02/2018	0089_MW142_S_180201	Normal	206292	340				4,000	-0.91		150	280	80	2,200
	MW142	8/01/2020	0089_MW142_200108	Normal	EP2000179	481	481	236	268	7,420	6.36	822	350	636	185	4,450
	MW142	30/03/2020	0089_MW142_200330	Normal	EP2003308	609	609	306	326	9,670	3.28	993	475	797	272	5,290
	MW142	20/07/2020	0089_MW142_200720	Normal	EP2007544	362	362	422	488	13,300	7.24	1,890	454	1,080	469	8,370
	MW142	23/09/2020	0089_MW142_200923	Normal	EP2010220	359	359	533	542	17,000	0.82	2,220	495	1,240	511	9,240
	MW142	14/12/2020	0089_MW142_201214	Normal	EP2013975	331	331	376	406	11,900	3.83	1,640	412	948	369	6,860
	MW142	16/03/2021	0089_MW142_210316	Normal	EP2102837	303	303	400	468	12,600	7.84	1,870	445	1,070	420	7,990
	MW142	8/06/2021	0089_MW142_210608	Normal	EP2106464	324	324	400	415	12,800	1.86	1,550	401	941	392	7,070
	MW142	30/08/2021	0089_MW142_210830	Normal	EP2110016	358	358	223	243	7,010	4.38	870	291	554	196	4,100
	MW142	10/01/2022	0089_MW142_220110	Normal	EP2200214	434	434	296	324	9,350	4.45	1,130	388	694	238	5,540
	MW142	15/03/2022	0089_MW142_220315	Normal	EP2203018	371	371	342	365	10,800	3.17	1,450	404	836	320	6,150
	MW142	8/06/2022	0089_MW142_220608	Normal	EP2206969	297	297	405	412	12,800	0.88	1,810	395	990	378	6,920
	MW142	5/09/2022	0089_MW142_220905	Normal	EP2211343	347	347	327	333	10,400	0.93	1,300	358	803	284	5,570
Demolition Ground	MW147	30/10/2010	C24-MB02	Normal	EP1005976											
	MW147	18/10/2013	QC37	Field Duplicate	EP1307981											
	MW147	18/10/2013	WA0006_C24_MB02	Normal	EP1307981											
	MW147	26/05/2015	C24_MB02	Normal	EP1510572											
	MW147	29/09/2015	C24_MB02	Normal	EP1514335											
	MW147	25/10/2016	C24_MB02	Normal	521581											
	MW147	1/08/2017	0089_MW147_S_170801	Normal	198918	440				4,800	4.5		270	330	96	2,900
	MW147	19/09/2017	0089_MW147_D_170919	Normal	176140											
	MW147	19/09/2017	0089_MW147_S_170919	Normal	176140											
	MW147	17/10/2017	0089_MW147_D_171017	Normal	177985											
	MW147	17/10/2017	0089_MW147_S_171017	Normal	177985											
	MW147	20/11/2017	0089_MW147_D_171120	Normal	203545											
	MW147	20/11/2017	0089_MW147_S_171120	Normal	203545											
	MW147	4/12/2017	0089_MW147_D_171204	Normal	204124											
	MW147	4/12/2017	0089_MW147_S_171204	Normal	204124											
	MW147	17/01/2018	0089_MW147_D_1801117	Normal	205691											
	MW147	17/01/2018	0089_MW147_S_1801117	Normal	205691											
	MW147	1/02/2018	0089_MW147_D_180201	Normal	206292	400				8,200	0.15		270	540	140	4,600
	MW147	1/02/2018	0089_MW147_I_180201	Normal	206292	400				7,900	-0.43		260	530	140	4,300
	MW147	1/02/2018	0089_MW147_S_180201	Normal	206292	440				4,100	-0.33		200	290	75	2,200
	MW147	20/07/2020	0089_MW147_200720	Normal	EP2007544	573	573	239	262	7,420	4.60	874	337	575	202	4,430

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Demolition Ground	MW149	1/08/2017	0089_MW149_S_170801	Normal	198918	270				15,000	1.1		420	970	270	8,300
	MW149	19/09/2017	0089_MW149_D_170919	Normal	176140											
	MW149	19/09/2017	0089_MW149_S_170919	Normal	176140											
	MW149	17/10/2017	0089_MW149_D_171017	Normal	177985											
	MW149	17/10/2017	0089_MW149_S_171017	Normal	177985											
	MW149	20/11/2017	0089_MW149_D_171120	Normal	203545											
	MW149	20/11/2017	0089_MW149_S_171120	Normal	203545											
	MW149	4/12/2017	0089_MW149_D_171204	Normal	204124											
	MW149	4/12/2017	0089_MW149_S_171204	Normal	204124											
	MW149	17/01/2018	0089_MW149_D_1801117	Normal	205691											
	MW149	17/01/2018	0089_MW149_S_1801117	Normal	205691											
	MW149	17/01/2018	0089_QC1MW_S_1801117	Field Duplicate	205691											
	MW149	17/01/2018	0089_QC2MW_180117	nterlab Duplicate	580891											
	MW149	17/01/2018	0089_QC2MW_180117	nterlab Duplicate	580891											
	MW149	1/02/2018	0089_MW149_D_180201	Normal	206292	220				15,000	0.49		330	960	290	8,500
	MW149	1/02/2018	0089_MW149_I_180201	Normal	206292	260				12,000	-0.79		290	790	250	6,800
	MW149	1/02/2018	0089_MW149_S_180201	Normal	206292	360				7,400	2.3		210	510	150	4,500
	MW149	8/01/2020	0089_MW149_200108	Normal	EP2000179	393	393	257	263	7,890	1.07	1,300	239	593	240	4,510
	MW149	30/03/2020	0089_MW149_200330	Normal	EP2003308	434	434	320	341	10,000	3.24	1,400	335	821	323	5,720
	MW149	20/07/2020	0089_MW149_200720	Normal	EP2007544	203	203	567	678	18,000	8.89	2,650	476	1,470	596	11,900
	MW149	23/09/2020	0089_MW149_200923	Normal	EP2010217	131	131	595	637	18,900	3.39	2,840	463	1,450	616	11,000
	MW149	14/12/2020	0089_MW149_201214	Normal	EP2013983	136	136	601	678	19,100	5.99	2,860	497	1,540	670	11,700
	MW149	16/03/2021	0089_MW149_210316	Normal	EP2102836	232	232	610	659	19,400	3.85	2,810	498	1,480	653	11,400
	MW149	8/06/2021	0089_MW149_210608	Normal	EP2106464	350	350	444	478	14,000	3.71	2,020	386	1,080	504	8,210
	MW149	8/06/2021	0089_QC105_210608	Field Duplicate	EP2106464	326	326	546	612	17,300	5.72	2,460	481	1,380	519	10,600
	MW149	8/06/2021	0089_QC205_210608	nterlab Duplicate	802464	390				16,000						
	MW149	30/08/2021	0089_MW149_210830	Normal	EP2110016	133	133	518	565	16,500	4.34	2,380	404	1,270	518	9,810
	MW149	10/01/2022	0089_MW149_220110	Normal	EP2200214	197	197	372	366	11,800	0.80	1,700	298	799	336	6,370
	MW149	15/03/2022	0089_MW149_220315	Normal	EP2203018	180	180	519	565	16,600	4.27	2,260				
	MW149	8/06/2022	0089_MW149_220608	Normal	EP2206969	200	200	533	579	16,900	4.16	2,500	456	1,370	553	9,870
	MW149	5/09/2022	0089_MW149_220905	Normal	EP2211343	139	139	517	509	16,500	0.80	2,350	397	1,230	453	8,650
Waste Water Treatment Plant	MW158	7/08/2017	0089_MW158_S_170807	Normal	199149	450				4,600	1.1		210	330	84	2,600
	MW158	8/01/2020	0089_MW158_200108	Normal	EP2000182	420	420	144	154	4,480	3.27	465	241	389	124	2,460
	MW158	31/03/2020	0089_MW158_200331	Normal	EP2003364	495	495	147	151	4,520	1.32	462	222	374	116	2,440
	MW158	21/07/2020	0089_MW158_200721	Normal	EP2007594	455	455	135	129	4,120	2.47	483	203	327	103	2,050
	MW158	21/09/2020	0089_MW158_200921	Normal	EP2010093	575	575	145	141	4,390	1.42	482	197	342	111	2,310
	MW158	14/12/2020	0089_MW158_201214	Normal	EP2013984	440	440	154	138	4,750	5.38	526	191	338	110	2,250
	MW158	15/03/2021	0089_MW158_210315	Normal	EP2102752	405	405	143	146	4,390	0.95	524	202	343	112	2,400
	MW158	10/06/2021	0089_MW158_210610	Normal	EP2106588	418	418	152	144	4,700	2.41	508	204	348	113	2,360
	MW158	30/08/2021	0089_MW158_210830	Normal	EP2110020	448	448	124	151	3,720	9.81	486	206	354	111	2,500
	MW158	30/08/2021	0089_QC110_210830	Field Duplicate	EP2110020	422	422	123	150	3,720	9.87	478	207	356	111	2,480
	MW158	30/08/2021	0089_QC210_210830	nterlab Duplicate	820919											
	MW158	15/03/2022	0089_MW158_220315	Normal	EP2203018	430	430	143	153	4,410	3.26	494	221	367	116	2,500
	MW158	7/06/2022	0089_MW158_220607	Normal	EP2206883	459	459	130	134	3,940	1.67	445	210	320	109	2,170
	MW158	5/09/2022	0089_MW158_220905	Normal	EP2211340	443	443	133	138	4,060	1.90	463	195	334	103	2,260
Waste Water Treatment Plant	MW161	7/08/2017	0089_MW161_S_170807	Normal	199149	390				1,100	0.39		150	86	41	610
	MW161	18/09/2017	0089_MW161_S_170918	Normal	176030											
	MW161	19/10/2017	0089_MW161_S_171019	Normal	178275											
	MW161	15/11/2017	0089_MW161_S_171115	Normal	203378											
	MW161	7/12/2017	0089_MW161_S_171207	Normal	204323											
	MW161	16/01/2018	0089_MW161_S_180116	Normal	205631											
	MW161	8/01/2020	0089_MW161_200108	Normal	EP2000182	311	311	30.4	32.2	672	2.94	249	125	87	36	411
	MW161	1/04/2020	0089_MW161_200401	Normal	EP2003417	318	318	33.1	34.3	777	1.75	233	132	96	40	432
	MW161	21/07/2020	0089_MW161_200721	Normal	EP2007594	400	400	30.3	29.9	673	0.63	158	86	98	34	383
	MW161	21/09/2020	0089_MW161_200921	Normal	EP2010093	353	353	32.1	34.4	721	3.44	226	126	96	38	442
	MW161	14/12/2020	0089_MW161_201214	Normal	EP2013992	327	327	32.9	30.6	774	3.53	217	119	76	36	403
	MW161	15/03/2021	0089_MW161_210315	Normal	EP2102752	337	337	32.6	30.5	779	3.30	188	78	81	38	437
	MW161	10/06/2021	0089_MW161_210610	Normal	EP2106588	324	324	32.1	33.8	792	2.69	156	139	79	39	446
	MW161	30/08/2021	0089_MW161_210830	Normal	EP2110020	393	393	32.5	32.6	762	0.18	152	122	89	37	420
	MW161	10/01/2022	0089_MW161_220110	Normal	EP2200216	460	460	30.6	25.2	654	9.69	145	84	82	32	310
	MW161	15/03/2022	0089_MW161_220315	Normal	EP2203018	420	420	32.7	33.9	742	1.74	164	122	105	42	416
	MW161	7/06/2022	0089_MW161_220607	Normal	EP2206883	498	498	32.4	29.9	670	3.99	169	93	98	39	372
	MW161	5/09/2022	0089_MW161_220905	Normal	EP2211340	382	382	32.7	29.5	755	5.21	181	87	71	36	422

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Waste Water Treatment Plant	MW166	7/08/2017	0089_MW166_S_170807	Normal	199149	430				1,000	2.5		150	100	37	590
	MW166	18/09/2017	0089_MW166_S_170918	Normal	176030											
	MW166	19/10/2017	0089_MW166_S_171019	Normal	178275											
	MW166	15/11/2017	0089_MW166_S_171115	Normal	203378											
	MW166	7/12/2017	0089_MW166_S_171207	Normal	204323											
	MW166	16/01/2018	0089_MW166_S_180116	Normal	205631											
	MW166	8/01/2020	0089_MW166_200108	Normal	EP2000182	539	539	40.5	44.2	946	4.34	145	172	114	51	572
	MW166	1/04/2020	0089_MW166_200401	Normal	EP2003417	542	542	45.0	48.4	1,080	3.62	179	194	124	59	621
	MW166	21/07/2020	0089_MW166_200721	Normal	EP2007594	590	590	43.3	43.1	1,000	0.24	158	158	112	48	569
	MW166	22/09/2020	0089_MW166_200922	Normal	EP2010151	518	518	40.2	37.9	958	2.99	137	145	96	46	496
	MW166	14/12/2020	0089_MW166_201214	Normal	EP2013984	394	394	36.9	34.4	899	3.50	176	120	92	41	455
	MW166	15/03/2021	0089_MW166_210315	Normal	EP2102752	388	388	37.8	41.9	943	5.24	164	140	109	50	568
	MW166	10/06/2021	0089_MW166_210610	Normal	EP2106588	515	515	47.1	50.5	1,150	3.45	212	153	142	53	686
	MW166	30/08/2021	0089_MW166_210830	Normal	EP2110019	363	363	36.1	37.0	908	1.18	156	132	96	41	493
	MW166	10/01/2022	0089_MW166_220110	Normal	EP2200211	366	366	36.6	31.3	924	7.74	155	112	79	35	422
	MW166	15/03/2022	0089_MW166_220315	Normal	EP2203018	413	413	44.7	46.8	1,140	2.36	206	144	124	50	648
	MW166	7/06/2022	0089_MW166_220607	Normal	EP2206883	388	388	34.6	32.9	828	2.43	167	118	90	42	427
	MW166	5/09/2022	0089_MW166_220905	Normal	EP2211340	360	360	34.6	33.3	856	1.92	158	110	93	39	441
Waste Water Treatment Plant	MW171	7/08/2017	0089_MW171_S_170807	Normal	199149	680				2,400	1.6		140	210	56	1,400
	MW171	18/09/2017	0089_MW171_S_170918	Normal	176030											
	MW171	19/10/2017	0089_MW171_S_171019	Normal	178275											
	MW171	15/11/2017	0089_MW171_S_171115	Normal	203378											
	MW171	7/12/2017	0089_MW171_S_171207	Normal	204323											
	MW171	16/01/2018	0089_MW171_S_180116	Normal	205631											
	MW171	1/04/2020	0089_MW171_200401	Normal	EP2003417	450	450	160	147	4,920	4.00	575	220	387	111	2,340
	MW171	21/07/2020	0089_MW171_200721	Normal	EP2007594	304	304	60.8	64.4	1,800	2.88	190	116	157	52	1,020
	MW171	14/12/2020	0089_MW171_201214	Normal	EP2013992	326	326	57.4	57.1	1,670	0.26	180	113	138	48	893
	MW171	15/03/2021	0089_MW171_210315	Normal	EP2102752	358	358	99.0	98.1	3,000	0.49	349	147	237	81	1,590
	MW171	10/06/2021	0089_MW171_210610	Normal	EP2106588	429	429	149	172	4,520	7.32	606	219	427	118	2,830
	MW171	30/08/2021	0089_MW171_210830	Normal	EP2110019	452	452	138	155	4,200	5.51	528	195	381	104	2,550
	MW171	10/01/2022	0089_MW171_220110	Normal	EP2200216	463	463	154	142	4,740	4.14	552	192	340	111	2,340
	MW171	15/03/2022	0089_MW171_220315	Normal	EP2203018	447	447	148	163	4,530	4.87	542	214	412	112	2,660
	MW171	7/06/2022	0089_MW171_220607	Normal	EP2206883	485	485	144	151	4,370	2.41	533	210	375	111	2,460
	MW171	5/09/2022	0089_MW171_220905	Normal	EP2211340	466	466	170	160	5,260	3.19	596	196	402	107	2,620
Waste Water Treatment Plant	MW172	7/08/2017	0089_MW172_S_170807	Normal	199149	480				5,000	2.2		230	380	94	2,900
	MW172	8/06/2022	0089_MW172_220608	Normal	EP2206971	455	455	47.3	55.2	1,190	7.75	222	119	153	64	806
	MW172	6/09/2022	0089_MW172_220906	Normal	EP2211400	404	404	43.6	42.0	1,110	1.90	203	99	117	48	602
Waste Water Treatment Plant	MW173	9/08/2017	0089_MW173_S_170809	Normal	199252	490				2,500	5.8		230	190	46	1,500
	MW173	18/09/2017	0089_MW173_S_170918	Normal	176030											
	MW173	19/10/2017	0089_MW173_S_171019	Normal	178275											
	MW173	15/11/2017	0089_MW173_S_171115	Normal	203378											
	MW173	7/12/2017	0089_MW173_S_171207	Normal	204323											
	MW173	16/01/2018	0089_MW173_S_180116	Normal	205631											
	MW173	16/01/2020	0089_MW173_200117	Normal	EP2000515	456	456	73.1	71.1	2,130	1.35	187	196	171	63	1,050
	MW173	31/03/2020	0089_MW173_200331	Normal	EP2003364	577	577	70.9	72.9	1,930	1.33	239	176	178	79	1,090
	MW173	22/07/2020	0089_MW173_200722	Normal	EP2007667	1,030	1,030	65.5	67.9	1,380	1.83	286	162	178	79	992
	MW173	16/03/2021	0089_MW173_210316	Normal	EP2102833	583	583	40.4	38.4	824	2.49	264	83	104	45	565
	MW173	16/03/2021	0089_QC114_210316	Field Duplicate	EP2102833	538	538	39.6	38.8	830	1.06	263	86	106	44	567
	MW173	16/03/2021	0089_QC214_210316	nterlab Duplicate	781350	590				830						
	MW173	10/06/2021	0089_MW173_210610	Normal	EP2106579	668	668	40.3	39.5	813	1.02	194	82	126	54	544
	MW173	15/03/2022	0089_MW173_220315	Normal	EP2203018	378	378	42.5	42.6	1,040	0.09	269	110	98	46	640
	MW173	8/06/2022	0089_MW173_220608	Normal	EP2206969	464	464	34.5	34.6	803	0.09	126	129	105	34	429
	MW173	5/09/2022	0089_MW173_220905	Normal	EP2211340	460	460	44.1	42.0	1,040	2.44	267	104	93	46	643
Waste Water Treatment Plant	MW193	8/08/2017	0089_MW193_S_170808	Normal	199212	470				1,100	-1.9		140	87	25	600
	MW193	18/09/2017	0089_MW193_S_170918	Normal	176030											
	MW193	19/10/2017	0089_MW193_S_171019	Normal	178275											
	MW193	15/11/2017	0089_MW193_S_171115	Normal	203378											
	MW193	7/12/2017	0089_MW193_S_171207	Normal	204323											
	MW193	16/01/2018	0089_MW193_S_180116	Normal	205631											
	MW193	8/01/2020	0089_MW193_200108	Normal	EP2000186	546	546	39.4	38.3	813	1.35	266	171	105	28	470
	MW193	31/03/2020	0089_MW193_200331	Normal	EP2003374	686	686	45.8	43.7	1,030	2.37	146	133	128	38	587
	MW193	15/07/2020	0089_MW193_200715	Normal	EP2007385	669	669	33.8	32.8	676	1.44	64	146	100	30	380
	MW193	16/12/2020	0089_MW193_201216	Normal	EP2014087	484	484	33.7	33.4	692	0.47	218	158	95	31	389
	MW193	16/03/2021	0089_MW193_210316	Normal	EP2102833	629	629	38.9	37.5	852	1.81	111	116	118	33	487
	MW193	10/06/2021	0089_MW193_210610	Normal	EP2106580	492	492	35.9	37.1	843	1.58	111	123	111	36	480
	MW193	30/08/2021	0089_MW193_210830	Normal	EP2110020	424	424	30.0	28.0	679	3.50	115	119	73	27	353
	MW193	30/08/2021	0089_QC113_210830	Field Duplicate	EP2110020	410	410	29.0	27.6	653	2.46	115	120	72	27	345
	MW193	30/08/2021	0089_QC213_210830	nterlab Duplicate	820919											
	MW193	10/01/2022	0089_MW193_220110	Normal	EP2200211	493	493	26.8	23.0	538	7.68	84	104	70	22	263
	MW193	15/03/2022	0089_MW193_220315	Normal	EP2203018	492	492	37.4	37.2	829	0.30	203	132	118	34	461
	MW193	7/06/2022	0089_MW193_220607	Normal	EP2206883	651	651	29.3	26.5	538	5.03	56	111	98	26	282
	MW193	5/09/2022	0089_MW193_220905	Normal	EP2211340	486	486	29.5	26.2	656	5.94	61	107	76	26	320
Waste Water Treatment Plant	MW195D	8/08/2017	0089_MW195_D_170808	Normal	199212	370				10,000	0.39		350	700	190	5,900
	MW195D	8/08/2017	0089_QC1MW_S_170808	Field Duplicate	199212	320				10,000	2.6		350	700	190	6,100
	MW195D	8/08/2017	0089_QC2MW_170808	nterlab Duplicate	558019	300				12,000						
	MW195D	8/01/2020	0089_MW195-D_200108	Normal	EP2000186	253	253	195	192	6,080	0.95	906	258	459	159	3,150
	MW195D	31/03/2020	0089_MW195_D_200331	Normal	EP2003364	158	158	342	369	10,800	3.71	1,660	434	917	315	6,060
	MW195D	15/07/2020	0089_MW195_D_200715	Normal	EP2007385	157	157	404	438	12,900	4.05	1,770	465	967	368	7,490
	MW195D	21/09/2020	0089_MW195-D_200921	Normal	EP2010093	162	162	380	390	12,000	1.32	1,840	421	923	344	6,540
	MW195D	16/12/2020	0089_MW195D_201216	Normal	EP2014087	193	193	363	396	11,500	4.43	1,660	448	949	349	6,600
	MW195D	16/03/2021	0089_MW195D_210316	Normal	EP2102833	146	146	418	436	13,500	2.11	1,670	461	1,000	383	7,390
	MW195D	16/03/2021	0089_QC115_210316	Field Duplicate	EP2102833	242	242	251	242	7,980	1.86	1,020	310	574	208	4,000
	MW195D	16/03/2021	0089_QC215_210316	nterlab Duplicate	781350	290										
	MW195D	8/06/2021	0089_QC212_210609	nterlab Duplicate	802464	330				10,000						

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
	MW195D	9/06/2021	0089_MW195D_210609	Normal	EP2106514	224	224	281	305	8,930	4.08	1,180	365	719	253	5,080
	MW195D	9/06/2021	0089_QC112_210609	Field Duplicate	EP2106514	220	220	283	312	9,000	4.75	1,200	371	731	260	5,200
	MW195D	30/08/2021	0089_MW195D_210830	Normal	EP2110020	170	170	312	341	9,860	4.44	1,480	365	785	297	5,770
	MW195D	30/08/2021	0089_QC111_210830	Field Duplicate	EP2110020	182	182	303	332	9,580	4.51	1,420	356	764	292	5,610
	MW195D	30/08/2021	0089_QC211_210830	nterlab Duplicate	820919											
	MW195D	10/01/2022	0089_MW195D_220110	Normal	EP2200216	172	172	363	327	11,600	5.28	1,560	379	752	261	5,500
	MW195D	15/03/2022	0089_MW195D_220315	Normal	EP2203018	182	182	322	336	10,200	2.14	1,480	389	814	279	5,580
	MW195D	7/06/2022	0089_MW195D_220607	Normal	EP2206883	168	168	398	369	12,700	3.76	1,730	440	874	340	6,120
	MW195D	5/09/2022	0089_MW195D_220905	Normal	EP2211340	167	167	338	351	10,800	1.76	1,470	385	834	261	5,890
	MW195S	8/08/2017	0089_MW195_S_170808	Normal	199212	420				360	0.68		140	51	11	210
	MW195S	18/09/2017	0089_MW195_S_170918	Normal	176030											
	MW195S	18/09/2017	0089_QC1MW_170918	Field Duplicate	176030											
	MW195S	18/09/2017	0089_QC2MW_170918	nterlab Duplicate	564343											
	MW195S	19/10/2017	0089_MW195_S_171019	Normal	178275											
	MW195S	19/10/2017	0089_QC1MW_171019	Field Duplicate	178275											
	MW195S	19/10/2017	0089_QC2MW_171019	nterlab Duplicate	568924											
	MW195S	15/11/2017	0089_MW195_S_171115	Normal	203378											
	MW195S	15/11/2017	0089_QC1MW_171115	Field Duplicate	203378											
	MW195S	15/11/2017	0089_QC2MW_171115	nterlab Duplicate	573296											
	MW195S	7/12/2017	0089_MW195_S_171207	Normal	204323											
	MW195S	7/12/2017	0089_QC1MW_171207	Field Duplicate	204323											
	MW195S	7/12/2017	0089_QC2MW_171207	nterlab Duplicate	576599											
	MW195S	16/01/2018	0089_MW195_S_180116	Normal	205631											
	MW195S	16/01/2018	0089_QC1MW_180116	Field Duplicate	205631											
	MW195S	16/01/2018	0089_QC2MW_180116	nterlab Duplicate	580891											
	MW195S	8/01/2020	0089_MW195-S_200108	Normal	EP2000186	559	559	48.8	48.0	1,110	0.80	304	144	142	50	641
	MW195S	8/01/2020	0089_QC102_200108	Field Duplicate	EP2000186	554	554	47.9	47.0	1,060	1.03	335	138	139	50	629
Waste Water Treatment Plant	MW195S	8/01/2020	0089_QC202_200108	nterlab Duplicate	696100	670				1,300						
	MW195S	31/03/2020	0089_MW195_S_200331	Normal	EP2003364	550	550	47.6	47.8	1,090	0.13	283	163	144	50	609
	MW195S	15/07/2020	0089_MW195_S_200715	Normal	EP2007385	603	603	53.8	57.6	1,250	3.40	310	194	159	54	768
	MW195S	21/09/2020	0089_MW195-S_200921	Normal	EP2010093	596	596	52.0	55.9	1,150	3.62	369	178	167	56	733
	MW195S	21/09/2020	0089_QC108_200921	Field Duplicate	EP2010093	585	585	63.3	72.7	1,520	6.93	419	204	199	70	1,020
	MW195S	21/09/2020	0089_QC208_200921	nterlab Duplicate	746269	2,300	2,300			1,400						
	MW195S	16/12/2020	0089_MW195S_201216	Normal	EP2014087	575	575	51.0	51.8	1,140	0.74	356	181	157	54	655
	MW195S	16/03/2021	0089_MW195S_210316	Normal	EP2102833	557	557	50.7	51.7	1,160	0.96	328	186	155	53	650
	MW195S	9/06/2021	0089_MW195S_210609	Normal	EP2106514	570	570	51.5	53.9	1,170	2.26	343	197	160	54	679
	MW195S	30/08/2021	0089_MW195S_210830	Normal	EP2110020	582	582	56.6	58.6	1,340	1.73	344	203	167	56	765
	MW195S	10/01/2022	0089_MW195S_220110	Normal	EP2200216	595	595	48.7	42.5	1,090	6.82	292	176	127	42	510
	MW195S	10/01/2022	0089_QC106_220110	Field Duplicate	EP2200216											
	MW195S	10/01/2022	0089_QC206_220110	nterlab Duplicate	854607											
	MW195S	15/03/2022	0089_MW195S_220315	Normal	EP2203018	574	574	47.2	47.4	1,040	0.13	309	198	147	47	556
	MW195S	15/03/2022	0089_QC111_220315	Field Duplicate	EP2203018											
	MW195S	15/03/2022	0089_QC211_220315	nterlab Duplicate	872903											
	MW195S	7/06/2022	0089_MW195S_220607	Normal	EP2206883	612	612	48.0	45.4	1,040	2.81	311	179	137	50	550
	MW195S	7/06/2022	0089_QC111_220607	Field Duplicate	EP2206883											
	MW195S	7/06/2022	0089_QC211_220607	nterlab Duplicate	896805											
	MW195S	5/09/2022	0089_MW195S_220905	Normal	EP2211340	598	598	46.0	43.3	998	2.96	282	177	132	43	518
	MW196	8/08/2017	0089_MW196_S_170808	Normal	199212	240				37	5.5		84	21	1.9	24
	MW196	2/04/2020	0089_MW196_200402	Normal	EP2003472	218	218	5.91	7.21	36	9.92	26	84	21	3	28
	MW196	22/07/2020	0089_MW196_200722	Normal	EP2007667	223	223	6.44	7.26	51	6.06	26	73	23	3	38
	MW196	24/09/2020	0089_MW196_200924	Normal	EP2010271	221	221	5.94	6.29	35	2.83	26	68	20	3	27
	MW196	16/12/2020	0089_MW196_201216	Normal	EP2014087	261	261	6.67	6.95	33	2.10	25	81	21	2	26
	MW196	16/12/2020	0089_QC116_201216	Field Duplicate	EP2014087	229	229	5.94	6.84	32	7.04	22	77	22	2	26
	MW196	16/12/2020	0089_QC216_201116	nterlab Duplicate	765054	450	450			74						
Waste Water Treatment Plant	MW196	10/06/2021	0089_MW196_210610	Normal	EP2106579	210	210	5.54	6.53	32	8.27	21	72	20	3	28
	MW196	30/08/2021	0089_MW196_210830	Normal	EP2110019	219	219	5.78	6.38	32	4.98	24	73	20	2	24
	MW196	30/08/2021	0089_QC112_210830	Field Duplicate	EP2110019	212	212	5.54	6.23	30	5.90	22	70	20	2	24
	MW196	30/08/2021	0089_QC212_210830	nterlab Duplicate	820919											
	MW196	13/01/2022	0089_MW196_220113	Normal	EP2200340	207	207	5.41	5.26	32	1.46	18	58	17	2	21
	MW196	14/03/2022	0089_MW196_220314	Normal	EP2202975	226	226	5.93	6.53	31	4.83	26	76	20	2	24
	MW196	14/03/2022	0089_QC108_220314	Field Duplicate	EP2202975											
	MW196	14/03/2022	0089_QC208_220314	nterlab Duplicate	872911											
	MW196	6/09/2022	0089_MW196_220906	Normal	EP2211389	229	229	5.93	5.91	31	0.17	23	66	19	2	23
	MW197	9/08/2017	0089_MW197_S_170809	Normal	199252	660				2,400	4.1		100	220	54	1,600
	MW197	18/09/2017	0089_MW197_S_170918	Normal	176030											
	MW197	19/10/2017	0089_MW197_S_171019	Normal	178275											
	MW197	15/11/2017	0089_MW197_S_171115	Normal	203378											
	MW197	7/12/2017	0089_MW197_S_171207	Normal	204323											
	MW197	16/01/2018	0089_MW197_S_180116	Normal	205631											
Waste Water Treatment Plant	MW197	31/03/2020	0089_MW197_200331	Normal	EP2003374	416	416	42.9	44.7	1,140	2.12	116	84	126	44	668
	MW197	15/07/2020	0089_MW197_200715	Normal	EP2007382	441	441	47.9	46.7	1,290	1.26	129	74	126	43	725
	MW197	16/03/2021	0089_MW197_210316	Normal	EP2102833	454	454	62.5	65.1	1,760	2.01	182	90	184	59	1,010
	MW197	9/06/2021	0089_MW197_210609	Normal	EP2106514	506	506	56.8	58.3	1,540	1.28	158	80	170	55	895
	MW197	1/09/2021	0089_MW197_210901	Normal	EP2110159	1,140	1,140	72.7	70.6	1,490	1.44	378	67	324	91	880
	MW197	7/06/2022	0089_MW197_220607	Normal	EP2206883	441	441	44.8	42.3	1,190	2.96	119	78	131	42	610
	MW197	5/09/2022	0089_MW197_220905	Normal	EP2211340	701	701	42.2	39.8	868	2.87	177	63	200	32	446
	MW199	8/08/2017	0089_MW199_S_170808	Normal	199212	400				8,100	4.8		290	590	130	5,000
	MW199	18/09/2017	0089_MW199_S_170918	Normal	176030											
	MW199	19/10/2017	0089_MW199_S_171019	Normal	178275											
	MW199	15/11/2017	0089_MW199_S_171115	Normal	203378											
	MW199	7/12/2017	0089_MW199_S_171207	Normal	204323											
	MW199	16/01/2018	0089_MW199_S_180116	Normal	205631											
	MW199	8/01/2020	0089_MW199_200108	Normal	EP2000186	366	366	35.8	34.9	928	1.32	111	76	80	29	546
	MW199	31/03/2020	0089_MW199_200331	Normal	EP2003364	863	863	227	244	7,030	3.54	573	325	622	193	3,950

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Waste Water Treatment Plant	MW199	15/07/2020	0089_MW199_200715	Normal	EP2007385	506	506	36.2	35.5	856	0.98	92	87	80	26	549
	MW199	21/09/2020	0089_MW199_200921	Normal	EP2010093	797	797	225	228	6,940	0.66	644	288	542	217	3,760
	MW199	16/12/2020	0089_MW199_201216	Normal	EP2014087	368	368	34.0	35.4	865	2.01	107	97	102	29	492
	MW199	30/08/2021	0089_MW199_210830	Normal	EP2110019	345	345	14.4	13.6	221	2.77	59	70	46	10	139
	MW199	10/01/2022	0089_MW199_220110	Normal	EP2200216	396	396	72.2	67.3	2,110	3.54	229	106	139	54	1,130
	MW199	17/03/2022	0089_MW199_220317	Normal	EP2203138	441	441	128	136	3,880	3.00	464	173	291	108	2,310
	MW199	7/06/2022	0089_MW199_220607	Normal	EP2206883	462	462	79.1	72.6	2,300	4.27	238	115	146	69	1,220
	MW199	7/06/2022	0089_QC109_220607	Field Duplicate	EP2206883											
	MW199	7/06/2022	0089_QC209_220607	Interlab Duplicate	896805											
	MW199	5/09/2022	0089_MW199_220905	Normal	EP2211340	349	349	22.5	19.6	495	6.95	75	94	47	14	245
	MW199	5/09/2022	0089_QC111_220905	Field Duplicate	EP2211340	357	357	29.3	25.7	715	6.44	95	96	61	19	355
	MW199	5/09/2022	0089_QC211_220905	Interlab Duplicate	920981											
Waste Water Treatment Plant	MW200	9/08/2017	0089_MW200_S_170809	Normal	199252	550				2,200	7.5		110	130	51	1,700
	MW200	18/09/2017	0089_MW200_S_170918	Normal	176030											
	MW200	19/10/2017	0089_MW200_S_171019	Normal	178275											
	MW200	15/11/2017	0089_MW200_S_171115	Normal	203378											
	MW200	7/12/2017	0089_MW200_S_171207	Normal	204323											
	MW200	16/01/2018	0089_MW200_S_180116	Normal	205631											
	MW200	9/01/2020	0089_MW200_200109	Normal	EP2000249	445	445	49.4	47.6	1,320	1.86	158	73	140	46	719
	MW200	31/03/2020	0089_MW200_200331	Normal	EP2003374	430	430	46.7	49.1	1,230	2.49	166	74	144	48	744
	MW200	15/07/2020	0089_MW200_200715	Normal	EP2007382	534	534	92.6	90.2	2,700	1.26	275	120	146	87	1,610
	MW200	24/09/2020	0089_MW200_200924	Normal	EP2010273	437	437	76.4	69.8	2,220	4.53	241	91	109	73	1,250
	MW200	15/12/2020	0089_MW200_201215	Normal	EP2014051	405	405	74.4	72.9	2,180	1.01	232	100	117	69	1,300
	MW200	15/12/2020	0089_QC115_201215	Field Duplicate	EP2014051	409	409	73.2	71.3	2,140	1.31	225	99	114	69	1,270
	MW200	15/12/2020	0089_QC215_201115	Interlab Duplicate	765054	480	480			2,400						
	MW200	16/03/2021	0089_MW200_210316	Normal	EP2102833	421	421	93.0	96.6	2,780	1.88	299	123	160	98	1,720
	MW200	9/06/2021	0089_MW200_210609	Normal	EP2106514	451	451	91.5	95.4	2,710	2.09	290	125	160	97	1,690
	MW200	1/09/2021	0089_MW200_210901	Normal	EP2110159	462	462	69.3	72.1	1,950	1.98	244	104	119	74	1,270
	MW200	10/01/2022	0089_MW200_220110	Normal	EP2200216	411	411	62.3	55.0	1,780	6.22	187	81	86	53	978
	MW200	14/03/2022	0089_MW200_220314	Normal	EP2202976	389	389	70.4	75.1	2,060	3.20	219	112	123	77	1,320
	MW200	7/06/2022	0089_MW200_220607	Normal	EP2206883	484	484	91.2	86.1	2,690	2.90	273	130	141	91	1,510
	MW200	5/09/2022	0089_MW200_220905	Normal	EP2211340	466	466	75.0	68.1	2,170	4.82	214	94	105	66	1,220
Waste Water Treatment Plant	MW202	9/08/2017	0089_MW202_S_170809	Normal	199252	400				280	3.4		100	35	12	240
	MW202	18/09/2017	0089_MW202_S_170918	Normal	176030											
	MW202	19/10/2017	0089_MW202_S_171019	Normal	178275											
	MW202	15/11/2017	0089_MW202_S_171115	Normal	203378											
	MW202	7/12/2017	0089_MW202_S_171207	Normal	204323											
	MW202	16/01/2018	0089_MW202_S_180116	Normal	205631											
	MW202	31/03/2020	0089_MW202_200331	Normal	EP2003374	371	373	11.3	11.2	112	0.42	35	98	24	8	96
	MW202	31/03/2020	0089_QC103_200331	Field Duplicate	EP2003374	363	368	11.2	11.0	112	0.81	35	96	24	8	94
	MW202	31/03/2020	0089_QC203_200331	Interlab Duplicate	711434	360	360			160						
	MW202	22/07/2020	0089_MW202_200722	Normal	EP2007667	364	364	11.9	11.8	128	0.33	48	97	24	8	110
	MW202	21/09/2020	0089_MW202_200921	Normal	EP2010077	367	367	12.1	11.1	133	4.22	50	95	23	8	99
	MW202	21/09/2020	0089_QC112_200921	Field Duplicate	EP2010077	364	364	11.9	11.5	131	1.73	46	100	24	8	100
	MW202	22/09/2020	0089_QC212_200921	Interlab Duplicate	746269	270	280			120						
	MW202	16/12/2020	0089_MW202_201216	Normal	EP2014087	349	349	12.6	13.3	167	2.50	46	107	23	9	134
	MW202	15/03/2021	0089_MW202_210315	Normal	EP2102755	319	319	10.5	11.5	111	4.52	47	100	24	8	99
	MW202	10/06/2021	0089_MW202_210610	Normal	EP2106588	320	320	11.3	11.6	137	1.12	52	104	26	7	94
	MW202	30/08/2021	0089_MW202_210830	Normal	EP2110019	356	356	15.2	13.9	245	4.66	59	100	22	12	156
	MW202	12/01/2022	0089_MW202_220112	Normal	EP2200288	344	344	13.8	12.4	198	5.20	64	93	28	12	119
	MW202	18/03/2022	0089_MW202_220318	Normal	EP2203194	349	349	15.4	14.6	249	2.77	70	115	32	13	136
	MW202	8/06/2022	0089_MW202_220608	Normal	EP2206971	382	382	19.8	21.0	367	2.84	90	139	44	18	230
	MW202	5/09/2022	0089_MW202_220905	Normal	EP2211345	411	411	26.0	23.5	548	5.03	112	121	51	31	287
Waste Water Treatment Plant	MW203	9/08/2017	0089_MW203_S_170809	Normal	199252	390				170	5.5		94	59	12	180
	MW203	8/01/2020	0089_MW203_200108	Normal	EP2000182	301	301	10.7	12.1	71	6.42	127	74	56	10	82
	MW203	31/03/2020	0089_MW203_200331	Normal	EP2003374	297	297	9.93	11.6	65	7.67	104	75	56	9	69
	MW203	31/03/2020	0089_QC102_200331	Field Duplicate	EP2003374	300	300	10.3	11.8	71	7.00	111	74	57	10	74
	MW203	31/03/2020	0089_QC202_200331	Interlab Duplicate	711434											
	MW203	15/07/2020	0089_MW203_200715	Normal	EP2007385	325	325	10.0	11.2	54	5.16	98	76	51	8	68
	MW203	22/09/2020	0089_MW203_200922	Normal	EP2010141	316	316	9.10	10.1	48	5.29	69	77	44	7	57
	MW203	16/12/2020	0089_MW203_201216	Normal	EP2014087	296	296	8.52	9.91	46	7.54	63	75	43	6	57
	MW203	16/03/2021	0089_MW203_210316	Normal	EP2102837	345	345	9.51	10.5	44	4.84	66	80	47	7	56
	MW203	9/06/2021	0089_MW203_210609	Normal	EP2106514	274	274	7.83	10.1	45	12.5	52	87	41	5	51
	MW203	30/08/2021	0089_MW203_210830	Normal	EP2110019	292	292	7.97	8.63	44	3.97	43	75	37	4	40
	MW203	10/01/2022	0089_MW203_220110	Normal	EP2200216	302	302	10.2	9.11	70	5.91	108	65	39	7	57
	MW203	17/03/2022	0089_MW203_220317	Normal	EP2203138	291	291	9.20	10.5	67	6.39	72	83	45	7	56
	MW203	7/06/2022	0089_MW203_220607	Normal	EP2206880	312	312	9.02	9.74	47	3.84	70	79	40	6	54
	MW203	7/06/2022	0089_QC115_220607	Field Duplicate	EP2206880											
	MW203	7/06/2022	0089_QC215_220607	Interlab Duplicate	896805											
	MW203	6/09/2022	0089_MW203_220906	Normal	EP2211390	292	292	8.55	9.32	44	4.31	71	75	39	6	51
Helicopter Support Facility	MW214	2/08/2017	0089_MW214_S_170802	Normal	198991	290				400	0.95		140	29	4.9	210
	MW214	1/09/2021	0089_MW214_210901	Normal	EP2110159	558	558	31.8	27.1	721	7.95	14	206	52	9	283
	MW214	13/01/2022	0089_MW214_220113	Normal	EP2200340	375	375	35.8	34.6	981	1.80	32	197	67	10	436
	MW214	16/03/2022	0089_MW214_220316	Normal	EP2203057	352	352	87.1	82.1	2,750	2.96	120	288	175	10	1,220
	MW214	7/06/2022	0089_MW214_220607	Normal	EP2206888	526	526	38.4	37.8	971	0.77	22	231	78	15	447
	MW214	6/09/2022	0089_MW214_220906	Normal	EP2211400	471	471	27.7	25.3	643	4.61	9	202	46	8	258
Helicopter Support Facility	MW215	2/08/2017	0089_MW215_S_170802	Normal	198991	200				160	5.3		100	18	4.4	80
	MW215	1/09/2021	0089_MW215_210901	Normal	EP2110159	324	324	14.2	12.5	229	6.28	59	116	27	5	100
	MW215	13/01/2022	0089_MW215_220113	Normal	EP2200340	290	290	16.8	15.4	325	4.05	86	123	34	8	145
	MW215	16/03/2022	0089_MW215_220316	Normal	EP2203057	310	310	28.1	27.2	685	1.56	125	192	56	16	291
	MW215	7/06/2022	0089_MW215_220607	Normal	EP2206888	316	316	28.3	24.8	676	6.52	139	173	48	14	273
	MW215	6/09/2022	0089_MW215_220906	Normal	EP2211400	311	311	21.1	19.2	466	4.64	84	142	38	11	201
	MW216	2/08/2017	0089_MW216_S_170802	Normal	198991	280				130	3.4		87	26	3.1	99
	MW216	11/09/2017	0089_MW216_S_170911	Normal	175533											

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Helicopter Support Facility	MW216	16/10/2017	0089_MW216_S_171016	Normal	177956											
	MW216	17/11/2017	0089_MW216_S_171117	Normal	203443											
	MW216	5/12/2017	0089_MW216_S_171205	Normal	204183											
	MW216	15/01/2018	0089_MW216_S_180115	Normal	205568											
	MW216	19/12/2019	0089_MW216_191219	Normal	EP1913598	258	258	12.0	11.9	198	0.16	59	103	26	5	104
	MW216	31/03/2020	0089_MW216_200331	Normal	EP2003366	240	240	16.4	16.8	371	1.26	56	140	41	7	145
	MW216	22/07/2020	0089_MW216_200722	Normal	EP2007667	287	287	15.8	15.4	312	1.26	62	130	36	6	134
	MW216	15/12/2020	0089_MW216_201215	Normal	EP2014041	354	354	17.3	16.8	309	1.21	71	148	41	7	136
	MW216	15/12/2020	0089_QC113_201215	Field Duplicate	EP2014041	385	385	17.9	17.1	310	2.18	71	150	42	8	138
	MW216	15/12/2020	0089_QC213_201115	nterlab Duplicate	765054	3,400	3,400			310						
	MW216	18/03/2021	0089_MW216_210318	Normal	EP2102955	318	318	16.7	16.5	309	0.72	80	135	40	8	144
	MW216	9/06/2021	0089_MW216_210609	Normal	EP2106514	310	310	17.8	17.4	361	1.36	70	144	40	7	154
	MW216	31/08/2021	0089_MW216_210831	Normal	EP2110071	313	313	19.2	16.6	407	7.23	68	128	38	7	158
	MW216	13/01/2022	0089_MW216_220113	Normal	EP2200340	324	324	20.8	19.5	446	3.01	82	148	49	5	184
	MW216	16/03/2022	0089_MW216_220316	Normal	EP2203057	356	356	20.8	18.6	423	5.61	87	144	44	7	176
	MW216	7/06/2022	0089_MW216_220607	Normal	EP2206888	343	343	20.3	18.2	407	5.41	96	148	41	7	168
	MW216	5/09/2022	0089_MW216_220905	Normal	EP2211340	287	287	23.0	22.1	533	2.12	110	162	50	8	223
Helicopter Support Facility	MW217	2/08/2017	0089_MW217_S_170802	Normal	198991	300				54	5.7		120	15	2.5	40
	MW217	11/09/2017	0089_MW217_S_170911	Normal	175533											
	MW217	11/09/2017	0089_QC1MW_170911	Field Duplicate	175533											
	MW217	11/09/2017	0089_QC2MW_170911	nterlab Duplicate	562844											
	MW217	16/10/2017	0089_MW217_S_171016	Normal	177956											
	MW217	17/11/2017	0089_MW217_S_171117	Normal	203443											
	MW217	5/12/2017	0089_MW217_S_171205	Normal	204183											
	MW217	15/01/2018	0089_MW217_S_180115	Normal	205568											
	MW217	19/12/2019	0089_MW217_191219	Normal	EP1913595	236	236	6.21	6.05	45	1.33	11	80	8	2	31
	MW217	31/03/2020	0089_MW217_200331	Normal	EP2003366	162	162	4.36	4.83	36	5.16	5	64	5	2	27
	MW217	22/07/2020	0089_MW217_200722	Normal	EP2007667	250	250	6.70	6.82	47	0.96	18	92	9	4	32
	MW217	22/07/2020	0089_QC114_200722	Field Duplicate	EP2007667	254	254	6.83	6.36	49	3.60	18	84	9	3	31
	MW217	22/07/2020	0089_QC214_200722	nterlab Duplicate	734409	290	290			50						
	MW217	24/09/2020	0089_MW217_200924	Normal	EP2010271	234	234	6.35	6.41	52	0.48	10	85	8	3	33
	MW217	15/12/2020	0089_MW217_201215	Normal	EP2014041	204	204	5.29	5.32	37	0.36	8	74	6	2	25
	MW217	18/03/2021	0089_MW217_210318	Normal	EP2102955	292	292	7.31	6.85	39	3.24	18	93	9	3	32
	MW217	9/06/2021	0089_MW217_210609	Normal	EP2106514	240	240	6.57	7.70	52	7.89	15	105	11	3	34
	MW217	31/08/2021	0089_MW217_210831	Normal	EP2110064	276	276	7.70	8.03	51	2.09	36	104	11	6	41
	MW217	13/01/2022	0089_MW217_220113	Normal	EP2200339	261	261	7.67	9.08	54	8.39	45	113	13	6	51
	MW217	17/03/2022	0089_MW217_220317	Normal	EP2203138	267	267	8.26	9.95	60	9.31	59	125	14	10	53
	MW217	8/06/2022	0089_MW217_220608	Normal	EP2206971	268	268	7.83	9.67	51	10.5	50	129	15	10	40
	MW217	8/09/2022	0089_MW217_220908	Normal	EP2211535	296	296	8.57	9.67	50	6.01	60	118	14	11	54
Helicopter Support Facility	MW220	26/02/2016	HDF_MB50	Normal	EP1601702											
	MW220	4/11/2016	HSF_MB50	Normal	522565											
	MW220	2/08/2017	0089_MW220_S_170802	Normal	198991	420				290	7.5		200	30	23	170
	MW220	11/09/2017	0089_MW220_S_170911	Normal	175533											
	MW220	16/10/2017	0089_MW220_S_171016	Normal	177956											
	MW220	17/11/2017	0089_MW220_S_171117	Normal	203443											
	MW220	5/12/2017	0089_MW220_S_171205	Normal	204183											
	MW220	5/12/2017	0089_QC1MW_171205	Field Duplicate	204183											
	MW220	5/12/2017	0089_QC2MW_171205	nterlab Duplicate	576083											
	MW220	15/01/2018	0089_MW220_S_180115	Normal	205568											
	MW220	9/06/2021	0089_MW220_210609	Normal	EP2106514											
	MW220	13/01/2022	0089_MW220_220113	Normal	EP2200339	359	359	9.85	10.0	69	0.89	35	109	22	15	55
	MW220	8/06/2022	0089_MW220_220608	Normal	EP2206971	340	340	9.10	11.0	50	9.33	43	128	21	13	58
	MW220	8/09/2022	0089_MW220_220908	Normal	EP2211535	352	352	9.23	9.39	50	0.84	38	114	18	12	44
Helicopter Support Facility	MW224	9/08/2017	0089_MW224_S_170809	Normal	199252	280				120	-0.52		79	26	3.3	83
	MW224	19/12/2019	0089_MW224_191219	Normal	EP1913595	206	206	7.39	8.31	94	5.85	30	67	20	4	74
	MW224	31/03/2020	0089_MW224_200331	Normal	EP2003366	222	222	8.29	8.86	113	3.30	32	72	22	4	77
	MW224	22/07/2020	0089_MW224_200722	Normal	EP2007667	241	241	9.08	9.27	124	1.03	37	70	23	4	87
	MW224	24/09/2020	0089_MW224_200924	Normal	EP2010273	231	231	8.85	9.23	122	2.13	38	70	22	4	88
	MW224	15/12/2020	0089_MW224_201215	Normal	EP2014041	237	237	8.52	8.55	109	0.20	34	64	20	4	83
	MW224	18/03/2021	0089_MW224_210318	Normal	EP2102955	214	214	8.28	8.59	114	1.82	38	63	20	4	85
	MW224	9/06/2021	0089_MW224_210609	Normal	EP2106514	216	216	8.29	8.85	112	3.30	39	64	21	4	88
	MW224	31/08/2021	0089_MW224_210831	Normal	EP2110064	225	225	8.83	8.24	125	3.50	39	56	21	4	83
	MW224	12/01/2022	0089_QC218_220113	nterlab Duplicate	855202											
	MW224	13/01/2022	0089_MW224_220113	Normal	EP2200339	219	219	8.55	8.55	120	<0.01	38	58	21	4	88
	MW224	13/01/2022	0089_QC118_220113	Field Duplicate	EP2200339											
	MW224	17/03/2022	0089_MW224_220317	Normal	EP2203138	233	233	8.86	9.08	121	1.24	38	66	21	4	91
	MW224	8/06/2022	0089_MW224_220608	Normal	EP2206971	242	242	8.88	9.66	113	4.23	41	67	25	5	95
	MW224	8/09/2022	0089_MW224_220908	Normal	EP2211535	234	234	8.61	8.46	110	0.85	40	58	21	4	86
Helicopter Support Facility	MW225	2/08/2017	0089_MW225_S_170802	Normal	198991	270				380	1.4		120	39	4.8	190
	MW225	11/09/2017	0089_MW225_S_170911	Normal	175533											
	MW225	19/10/2017	0089_MW225_S_171019	Normal	178275											
	MW225	17/11/2017	0089_MW225_S_171117	Normal	203443											
	MW225	5/12/2017	0089_MW225_S_171205	Normal	204183											
	MW225	15/01/2018	0089_MW225_S_180115	Normal	205568											
	MW225	1/09/2021	0089_MW225_210901	Normal	EP2110160	302	302	22.0	18.6	522	8.23	58	134	39	8	196
	MW225	13/01/2022	0089_MW225_220113	Normal	EP2200340	399	399	26.6	24.0	620	4.98	53	146	54	7	279
	MW225	16/03/2022	0089_MW225_220316	Normal	EP2203057	342	342	24.5	23.4	588	2.28	54	149	53	10	262
	MW225	7/06/2022	0089_MW225_220607	Normal	EP2206888	319	319	21.7	20.2	503	3.71	55	140	42	9	218
	MW225	7/06/2022	0089_QC112_220607	Field Duplicate	EP2206888											
	MW225	7/06/2022	0089_QC212_220607	nterlab Duplicate	896805											
	MW225	6/09/2022	0089_MW225_220906	Normal	EP2211400	314	314	19.2	17.1	425	5.78	46	124	39	6	174
	MW226	2/08/2017	0089_MW226_S_170802	Normal	198991	630				15,000	0.78		400	1,000	340	9,000
	MW226	2/08/2017	0089_QC1MW_170802	Field Duplicate	198991	630				16,000	-0.27		400	1,100	340	9,100
	MW226	3/08/2017	0089_QC2MW_170802	nterlab Duplicate	557195	590				16,000						

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Helicopter Support Facility	MW226	11/09/2017	0089_MW226_S_170911	Normal	175533											
	MW226	19/10/2017	0089_MW226_S_171019	Normal	178275											
	MW226	17/11/2017	0089_MW226_S_171117	Normal	203443											
	MW226	5/12/2017	0089_MW226_S_171205	Normal	204183											
	MW226	15/01/2018	0089_MW226_S_180115	Normal	205568											
	MW226	14/01/2020	0089_MW226_200114	Normal	EP2000432	540	540	434	481	13,400	5.05	2,190	455	1,150	479	8,070
	MW226	2/04/2020	0089_MW226_200402	Normal	EP2003472	612	612	476	560	14,600	8.07	2,500	482	1,290	601	9,520
	MW226	2/04/2020	0089_QC101_200402	Field Duplicate	EP2003472	557	557	482	533	14,800	5.11	2,540	458	1,230	576	9,070
	MW226	2/04/2020	0089_QC201_200402	nterlab Duplicate	712006	360	360			16,000						
	MW226	21/07/2020	0089_MW226_200721	Normal	EP2007611	621	621	465	524	14,400	5.96	2,230	446	1,200	534	8,950
	MW226	22/09/2020	0089_MW226_200922	Normal	EP2010143	637	637	484	415	15,100	7.64	2,180	347	944	433	7,110
	MW226	15/12/2020	0089_MW226_201215	Normal	EP2014042	553	553	475	512	14,700	3.82	2,350	452	1,210	529	8,660
	MW226	17/03/2021	0089_MW226_210317	Normal	EP2102900	542	542	459	509	14,200	5.14	2,300	444	1,170	546	8,660
	MW226	10/06/2021	0089_MW226_210610	Normal	EP2106588	561	561	476	535	14,800	5.88	2,250	452	1,250	538	9,100
	MW226	31/08/2021	0089_MW226_210831	Normal	EP2110071	666	666	457	462	14,200	0.46	2,090	388	1,080	450	7,860
	MW226	13/01/2022	0089_MW226_220113	Normal	EP2200340	664	664	474	505	14,900	3.21	1,940	411	1,170	465	8,660
	MW226	16/03/2022	0089_MW226_220316	Normal	EP2203057	612	612	509	500	16,000	0.88	2,180	416	1,160	550	8,500
	MW226	7/06/2022	0089_MW226_220607	Normal	EP2206888	644	644	446	529	13,700	8.49	2,260	477	1,290	508	8,880
	MW226	6/09/2022	0089_MW226_220906	Normal	EP2211390	593	593	442	461	13,700	2.14	2,090	393	1,060	484	7,860
Helicopter Support Facility	MW227	2/08/2017	0089_MW227_S_170802	Normal	198991	350				1,400	0.97		140	87	28	820
	MW227	11/09/2017	0089_MW227_S_170911	Normal	175533											
	MW227	19/10/2017	0089_MW227_S_171019	Normal	178275											
	MW227	17/11/2017	0089_MW227_S_171117	Normal	203443											
	MW227	5/12/2017	0089_MW227_S_171205	Normal	204183											
	MW227	15/01/2018	0089_MW227_S_180115	Normal	205568											
	MW227	1/04/2020	0089_MW227_200401	Normal	EP2003417	464	464	37.7	35.0	886	3.75	164	134	74	27	494
	MW227	1/04/2020	0089_QC104_200401	Field Duplicate	EP2003417	369	369	33.1	31.5	797	2.50	156	126	66	23	441
	MW227	1/04/2020	0089_QC204_200401	nterlab Duplicate	711709	730	730			880						
	MW227	22/07/2020	0089_MW227_200722	Normal	EP2007648	332	332	31.1	30.0	768	1.76	135	121	60	24	424
	MW227	21/09/2020	0089_MW227_200921	Normal	EP2010085	361	361	31.4	31.3	711	0.25	200	130	69	21	427
	MW227	15/12/2020	0089_MW227_201215	Normal	EP2014051	375	375	37.4	38.3	910	1.21	204	121	68	25	599
	MW227	15/03/2021	0089_MW227_210315	Normal	EP2102752	528	528	53.3	52.8	1,240	0.46	373	188	126	22	747
	MW227	10/06/2021	0089_MW227_210610	Normal	EP2106588	315	315	50.1	54.5	1,410	4.22	193	132	99	53	883
	MW227	31/08/2021	0089_MW227_210831	Normal	EP2110071	360	360	38.2	34.5	940	5.10	217	142	83	40	450
	MW227	14/01/2022	0089_MW227_220114	Normal	EP2200399	357	357	35.2	32.7	834	3.63	217	116	71	25	470
	MW227	16/03/2022	0089_MW227_220316	Normal	EP2203057	550	550	62.9	62.2	1,540	0.52	407	227	143	46	873
	MW227	7/06/2022	0089_MW227_220607	Normal	EP2206888	503	503	51.9	45.7	1,260	6.31	302	157	106	45	644
	MW227	7/09/2022	0089_MW227_220907	Normal	EP2211611	374	374	40.1	39.1	968	1.25	255	134	78	40	574
Helicopter Support Facility	MW228	2/08/2017	0089_MW228_S_170802	Normal	198991	380				10,000	4.0		360	750	200	6,300
	MW228	11/09/2017	0089_MW228_S_170911	Normal	175533											
	MW228	19/10/2017	0089_MW228_S_171019	Normal	178275											
	MW228	17/11/2017	0089_MW228_S_171117	Normal	203443											
	MW228	5/12/2017	0089_MW228_S_171205	Normal	204183											
	MW228	15/01/2018	0089_MW228_S_180115	Normal	205568											
	MW228	15/01/2018	0089_QC1MW_180115	Field Duplicate	205568											
	MW228	15/01/2018	0089_QC2MW_180115	nterlab Duplicate	580891											
	MW228	14/01/2020	0089_MW228_200114	Normal	EP2000432	612	612	232	283	6,930	9.94	1,160	294	642	264	4,800
	MW228	1/04/2020	0089_MW228_200401	Normal	EP2003417	717	717	310	320	9,490	1.44	1,370	301	724	327	5,440
	MW228	1/04/2020	0089_QC103_200401	Field Duplicate	EP2003417	542	542	328	344	10,200	2.46	1,400	317	789	335	5,860
	MW228	1/04/2020	0089_QC203_200401	nterlab Duplicate	711709	900	900			10,000						
	MW228	22/07/2020	0089_MW228_200722	Normal	EP2007648	418	418	331	377	10,300	6.53	1,550	325	836	328	6,530
	MW228	22/07/2020	0089_QC112_200722	Field Duplicate	EP2007648	380	380	346	362	10,800	2.33	1,620	321	802	320	6,260
	MW228	22/07/2020	0089_QC212_200722	nterlab Duplicate	734409	450	450			11,000						
	MW228	21/09/2020	0089_MW228_200921	Normal	EP2010085	505	505	290	279	8,840	1.92	1,460	271	651	256	4,720
	MW228	15/12/2020	0089_MW228_201215	Normal	EP2014047	419	419	311	321	9,600	1.69	1,510	307	772	296	5,400
	MW228	15/03/2021	0089_MW228_210315	Normal	EP2102752	491	491	323	331	10,000	1.28	1,490	299	777	296	5,630
	MW228	10/06/2021	0089_MW228_210610	Normal	EP2106588	328	328	356	355	11,300	0.18	1,500	310	830	324	6,050
	MW228	31/08/2021	0089_MW228_210831	Normal	EP2110071	606	606	228	241	6,910	2.84	1,010	215	536	202	4,170
	MW228	14/01/2022	0089_MW228_220114	Normal	EP2200399	549	549	208	215	6,270	1.71	961	196	468	178	3,730
	MW228	16/03/2022	0089_MW228_220316	Normal	EP2203057	706	706	157	147	4,570	3.36	666	142	334	131	2,500
	MW228	7/06/2022	0089_MW228_220607	Normal	EP2206888	515	515	243	215	7,410	5.99	1,120	209	490	172	3,680
	MW228	7/09/2022	0089_MW228_220907	Normal	EP2211495	717	717	95.6	96.0	2,530	0.22	474	117	263	93	1,520
Infiltration Swale	MW233	8/08/2017	0089_MW233_S_170808	Normal	199212	150				22	-1.5		45	6.9	4	17
	MW233	13/09/2017	0089_MW233_S_170913	Normal	175739											
	MW233	20/10/2017	0089_MW233_S_171020	Normal	178263											
	MW233	21/11/2017	0089_MW233_S_171121	Normal	203587											
	MW233	5/12/2017	0089_MW233_S_171205	Normal	204183											
	MW233	19/01/2018	0089_MW233_S_180119	Normal	205805											
	MW233	8/01/2020	0089_MW233_200108	Normal	EP2000182	170	170	4.57	4.52	29	0.48	17	58	8	4	20
	MW233	30/03/2020	0089_MW233_200330	Normal	EP2003313	125	125	3.14	3.60	14	6.79	12	48	6	4	14
	MW233	15/07/2020	0089_MW233_200715	Normal	EP2007385	139	139	3.62	3.62	24	0.04	8	48	6	3	15
	MW233	15/07/2020	0089_QC107_200715	Field Duplicate	EP2007385	135	135	3.57	3.39	25	2.63	8	45	5	3	15
	MW233	15/07/2020	0089_QC207_200215	nterlab Duplicate	732844	160	160			21						
	MW233	21/09/2020	0089_MW233_200921	Normal	EP2010085	150	150	3.90	3.83	27	0.97	7	47	6	3	21
	MW233	15/12/2020	0089_MW233_201215	Normal	EP2014041	152	152	3.70	4.17	19	5.97	6	53	7	3	20
	MW233	15/03/2021	0089_MW233_210315	Normal	EP2102755	127	127	3.06	3.49	15	6.53	5	42	6	3	19
	MW233	15/03/2021	0089_QC104_210315	Field Duplicate	EP2102755	136	136	3.30	3.27	17	0.51	5	40	5	3	18
	MW233	15/03/2021	0089_QC204_210315	nterlab Duplicate	781350	150				43						
	MW233	9/06/2021	0089_MW233_210609	Normal	EP2106515	121	121	2.92	3.01	14	1.60	5	38	5	2	15
	MW233	30/08/2021	0089_MW233_210830	Normal	EP2110016	107	107	3.16	3.14	29	0.43	10	40	5	3	15
	MW233	30/08/2021	0089_QC102_210830	Field Duplicate	EP2110016	118	118	3.72	3.78	40	0.94	11	47	6	3	20
	MW233	30/08/2021	0089_QC202_210830	nterlab Duplicate	820919											
	MW233	10/01/2022	0089_MW233_220110	Normal	EP2200216	93	93	3.55	3.01	57	8.23	4	37	4	2	18
	MW233	17/03/2022	0089_MW233_220317	Normal	EP2203138	91	91	3.42	3.16	54	4.03	4	40	4	2	18

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
	MW233	8/06/2022	0089_MW233_220608	Normal	EP2206969	106	106	2.50	2.50	12	0.02	2	32	4	2	12
	MW233	6/09/2022	0089_MW233_220906	Normal	EP2211390	107	107	2.75	2.51	18	4.52	5	34	4	2	10
	MW236	8/08/2017	0089_MW236_S_170808	Normal	199212	280				36	7.1		110	17	0.9	21
	MW236	13/09/2017	0089_MW236_S_170913	Normal	175739											
	MW236	20/10/2017	0089_MW236_S_171020	Normal	178263											
	MW236	21/11/2017	0089_MW236_S_171121	Normal	203587											
	MW236	5/12/2017	0089_MW236_S_171205	Normal	204183											
	MW236	19/01/2018	0089_MW236_S_180119	Normal	205805											
	MW236	2/04/2020	0089_MW236_200402	Normal	EP2003472	254	254	6.18	6.68	26	3.84	18	94	14	2	18
	MW236	16/07/2020	0089_MW236_200716	Normal	EP2007438	342	342	8.17	7.00	32	7.76	21	97	15	2	20
Fuel Farm	MW236	16/07/2020	0089_QC108_200716	Field Duplicate	EP2007438	268	268	6.72	6.80	33	0.54	21	93	15	2	20
	MW236	20/07/2020	0089_QC208_200716	Interlab Duplicate	733018	330	330			31						
	MW236	21/09/2020	0089_MW236_200921	Normal	EP2010077	260	260	6.65	6.88	36	1.76	21	94	16	2	19
	MW236	15/12/2020	0089_MW236_201215	Normal	EP2014041	244	244	6.25	6.71	37	3.53	16	93	15	2	18
	MW236	16/03/2021	0089_MW236_210316	Normal	EP2102833	238	238	6.28	7.15	40	6.47	19	95	17	2	22
	MW236	10/06/2021	0089_MW236_210610	Normal	EP2106579	243	243	6.20	7.12	36	6.86	16	97	17	2	19
	MW236	31/08/2021	0089_MW236_210831	Normal	EP2110073	244	244	7.20	8.42	58	7.82	33	105	19	2	36
	MW236	10/01/2022	0089_MW236_220110	Normal	EP2200211	259	259	6.94	6.75	42	1.41	28	89	14	1	26
	MW236	7/06/2022	0089_MW236_220607	Normal	EP2206880	280	280	6.75	6.29	24	3.50	23	85	13	1	22
	MW236	6/09/2022	0089_MW236_220906	Normal	EP2211390	264	264	6.95	7.06	38	0.77	29	89	17	<1	28
	MW238	4/08/2017	0089_MW238_S_170804	Normal	199095	200				33	8.4		88	16	2.6	23
	MW238	13/09/2017	0089_MW238_S_170913	Normal	175739											
	MW238	13/09/2017	0089_QC1MW_170913	Field Duplicate	175739											
	MW238	13/09/2017	0089_QC2MW_170913	Interlab Duplicate	565731											
	MW238	20/10/2017	0089_MW238_S_171020	Normal	178263											
	MW238	21/11/2017	0089_MW238_S_171121	Normal	203587											
	MW238	5/12/2017	0089_MW238_S_171205	Normal	204183											
	MW238	19/01/2018	0089_MW238_S_180119	Normal	205805											
	MW238	14/01/2020	0089_MW238_200114	Normal	EP2000432	170	170	7.43	8.38	118	5.98	34	75	18	6	69
	MW238	1/04/2020	0089_MW238_200401	Normal	EP2003438	200	200	6.74	8.03	34	8.69	86	100	19	5	31
AVCAT Storage	MW238	16/07/2020	0089_MW238_200716	Normal	EP2007438	215	215	7.05	7.20	38	1.01	81	88	17	4	30
	MW238	21/09/2020	0089_MW238_200921	Normal	EP2010077	206	206	6.63	7.15	39	3.79	68	88	17	4	29
	MW238	15/12/2020	0089_MW238_201215	Normal	EP2014041	190	190	5.87	6.84	38	7.66	48	86	16	4	26
	MW238	15/12/2020	0089_QC114_201215	Field Duplicate	EP2014041	193	193	6.01	6.70	35	5.42	56	84	16	4	25
	MW238	15/12/2020	0089_QC214_201115	Interlab Duplicate	765054	220	220			120						
	MW238	18/03/2021	0089_MW238_210318	Normal	EP2102955	189	189	6.44	7.37	34	6.70	82	91	18	5	28
	MW238	10/06/2021	0089_MW238_210610	Normal	EP2106580	198	198	6.60	7.27	42	4.82	70	86	18	4	32
	MW238	31/08/2021	0089_MW238_210831	Normal	EP2110073	180	180	5.44	6.77	47	10.9	25	88	14	2	27
	MW238	12/01/2022	0089_MW238_220112	Normal	EP2200288	193	193	5.84	6.31	41	3.86	40	81	14	3	24
	MW238	18/03/2022	0089_MW238_220318	Normal	EP2203194	206	206	6.79	7.22	38	3.08	77	92	17	4	26
	MW238	9/06/2022	0089_MW238_220609	Normal	EP2207028	208	208	6.82	7.16	39	2.42	75	89	18	4	26
	MW238	6/09/2022	0089_MW238_220906	Normal	EP2211389	205	205	5.66	6.08	31	3.62	33	78	13	3	24
	MW239	4/08/2017	0089_MW239_S_170804	Normal	199095	240				32	7.3		100	17	2.7	24
	MW239	22/07/2020	0089_MW239_200722	Normal	EP2007648	225	225	6.54	7.08	35	3.95	51	93	15	3	26
	MW239	21/09/2020	0089_MW239_200921	Normal	EP2010077	220	220	6.51	6.84	33	2.44	57	89	15	3	25
	MW239	15/12/2020	0089_MW239_201215	Normal	EP2014041	221	221	6.64	7.39	31	5.35	65	93	19	4	25
	MW239	18/03/2021	0089_MW239_210318	Normal	EP2102954	217	217	6.87	7.48	30	4.25	81	88	22	4	27
AVCAT Storage	MW239	10/06/2021	0089_MW239_210610	Normal	EP2106579	225	225	7.00	7.26	32	1.82	77	82	23	4	27
	MW239	31/08/2021	0089_MW239_210831	Normal	EP2110073	199	199	5.81	6.21	34	3.32	42	78	14	3	25
	MW239	12/01/2022	0089_MW239_220112	Normal	EP2200288	213	213	6.06	5.73	28	2.82	49	75	13	2	20
	MW239	18/03/2022	0089_MW239_220318	Normal	EP2203194	238	238	7.41	7.36	32	0.33	84	88	20	4	28
	MW239	9/06/2022	0089_MW239_220609	Normal	EP2207028	230	230	6.54	6.98	32	3.25	50	91	16	3	24
	MW239	6/09/2022	0089_MW239_220906	Normal	EP2211389	202	202	5.63	5.96	36	2.77	28	81	11	2	22
	MW240	4/08/2017	0089_MW240_S_170804	Normal	199095	280				43	11		140	16	3.3	26
	MW240	14/01/2020	0089_MW240_200114	Normal	EP2000432	254	254						119	19	5	85
	MW240	1/04/2020	0089_MW240_200401	Normal	EP2003438	320	320	9.00	8.59	51	2.32	56	117	14	3	35
	MW240	16/07/2020	0089_MW240_200716	Normal	EP2007438	262	262	8.11	8.52	46	2.43	76	117	16	4	29
	MW240	21/09/2020	0089_MW240_200921	Normal	EP2010077	267	267	7.74	8.48	47	4.53	52	120	14	3	29
	MW240	21/09/2020	0089_QC106_200921	Field Duplicate	EP2010077	263	263	7.73	8.65	48	5.62	54	123	14	4	29
	MW240	21/09/2020	0089_QC206_200921	Interlab Duplicate	746269	240	240			50						
	MW240	15/12/2020	0089_MW240_201215	Normal	EP2014041	251	251	7.39	8.35	43	6.06	56	120	14	3	26
AVCAT Storage	MW240	18/03/2021	0089_MW240_210318	Normal	EP2102954	241	241	8.08	9.36	78	7.34	51	131	14	4	36
	MW240	10/06/2021	0089_MW240_210610	Normal	EP2106580	249	249	8.12	9.08	59	5.63	71	124	16	4	34
	MW240	31/08/2021	0089_MW240_210831	Normal	EP2110073	263	263	7.67	8.57	54	5.52	43	122	12	4	32
	MW240	12/01/2022	0089_MW240_220112	Normal	EP2200288	299	299	8.68	7.67	53	6.15	58	108	12	3	28
	MW240	12/01/2022	0089_QC115_220112	Field Duplicate	EP2200288	259	259	6.95	6.50	35	3.35	38				
	MW240	12/01/2022	0089_QC215_220112	Interlab Duplicate	855202											
	MW240	18/03/2022	0089_MW240_220318	Normal	EP2203194	245	245	8.14	9.41	64	7.25	69	133	15	4	33
	MW240	9/06/2022	0089_MW240_220609	Normal	EP2207028	252	252	8.20	9.52	68	7.44	60	131	16	4	36
	MW240	6/09/2022	0089_MW240_220906	Normal	EP2211389	255	255	7.04	8.00	40	6.43	39	112	12	3	31
	MW242	7/08/2017	0089_MW242_S_170807	Normal	199149	230				43	5.5		90	14	2.6	31
	MW242	8/01/2020	0089_MW242_200108	Normal	EP2000182	185	185	4.70	4.94	18	2.44	24	69	11	1	13
	MW242	30/03/2020	0089_MW242_200330	Normal	EP2003313	181	181	4.81	5.67	23	8.26	26	77	12	4	17
	MW242	16/07/2020	0089_MW242_200716	Normal	EP2007438	206	206	5.78	5.94	36	1.37	31	79	12	2	22
	MW242	21/09/2020	0089_MW242_200921	Normal	EP2010077	212	212	6.10	6.51	41	3.27	34	82	14	2	28
	MW242	15/12/2020	0089_MW242_201215	Normal	EP2014041	198	198	5.58	6.24	36	5.66	29	80	13	2	26
AVCAT Storage	MW242	18/03/2021	0089_MW242_210318	Normal	EP2102954	183	183	4.94	5.41	25	4.54	28	72	12	2	18
	MW242	9/06/2021	0089_MW242_210609	Normal	EP2106516	188	188	5.53	5.65	40	1.08	31	67	12	4	28
	MW242	31/08/2021	0089_MW242_210831	Normal	EP2110073	210	210	7.69	9.34	87	9.71	50	97	22	5	59
	MW242	12/01/2022	0089_MW242_220112	Normal	EP2200288	194	194	4.84	4.31	15	5.74	26	59	10	1	12
	MW242	17/03/2022	0089_MW242_220317	Normal	EP2203138	186	186	4.66	4.75	15	0.92	25	66	11	1	12
	MW242	8/06/2022	0089_MW242_220608	Normal	EP2206969	199	199	5.02	5.14	18	1.14	26	70	12	2	14
	MW242	6/09/2022	0089_MW242_220906	Normal	EP2211389	206	206	6.13	6.66	39	4.13	44	76	17	3	32
	MW243	4/08/2017	0089_MW243_S_170804	Normal	199095	300				42	7.1		120	17	3.8	29

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
AVCAT Storage	MW243	13/09/2017	0089_MW243_S_170913	Normal	175739											
	MW243	20/10/2017	0089_MW243_S_171020	Normal	178263											
	MW243	21/11/2017	0089_MW243_S_171121	Normal	203587											
	MW243	5/12/2017	0089_MW243_S_171205	Normal	204183											
	MW243	19/01/2018	0089_MW243_S_180119	Normal	205805											
	MW243	14/01/2020	0089_MW243_200114	Normal	EP2000432	255	255	7.09	7.38	53	2.01	24	100	13	4	28
	MW243	1/04/2020	0089_MW243_200401	Normal	EP2003438	226	226	6.80	7.35	56	3.85	34	95	13	4	33
	MW243	16/07/2020	0089_MW243_200716	Normal	EP2007438	260	260	7.52	8.00	52	3.16	41	106	14	5	33
	MW243	21/09/2020	0089_MW243_200921	Normal	EP2010077	255	255	7.44	8.16	58	4.59	34	107	15	4	34
	MW243	15/12/2020	0089_MW243_201215	Normal	EP2014041	253	253	7.67	8.78	55	6.76	51	117	16	4	35
	MW243	18/03/2021	0089_MW243_210318	Normal	EP2102955	263	263	8.24	9.38	63	6.45	58	122	18	6	38
	MW243	10/06/2021	0089_MW243_210610	Normal	EP2106579	258	258	7.26	8.13	42	5.70	44	106	16	7	31
	MW243	31/08/2021	0089_MW243_210831	Normal	EP2110073	252	252	7.36	8.41	55	6.69	37	112	15	6	33
	MW243	12/01/2022	0089_MW243_220112	Normal	EP2200288	246	246	7.15	7.85	55	4.63	33	106	14	4	30
	MW243	18/03/2022	0089_MW243_220318	Normal	EP2203194	264	264	8.73	10.2	84	7.64	52	128	18	5	50
	MW243	9/06/2022	0089_MW243_220609	Normal	EP2207028	285	285	8.82	9.74	76	4.97	47	123	20	5	42
	MW243	6/09/2022	0089_MW243_220906	Normal	EP2211389	264	264	8.37	9.01	70	3.67	54	116	17	5	39
AVCAT Storage	MW245	4/08/2017	0089_MW245_S_170804	Normal	199095	550				21	3.7		200	19	2.4	17
	MW245	13/09/2017	0089_MW245_S_170913	Normal	175739											
	MW245	20/10/2017	0089_MW245_S_171020	Normal	178263											
	MW245	21/11/2017	0089_MW245_S_171121	Normal	203587											
	MW245	5/12/2017	0089_MW245_S_171205	Normal	204183											
	MW245	19/01/2018	0089_MW245_S_180119	Normal	205805											
	MW245	14/01/2020	0089_MW245_200114	Normal	EP2000432	320	320	7.18	7.66	25	3.23	4	110	13	4	23
	MW245	1/04/2020	0089_MW245_200401	Normal	EP2003438	408	408	8.69	10.1	19	7.45	<1	154	16	5	22
	MW245	16/07/2020	0089_MW245_200716	Normal	EP2007438	555	555	12.6	12.7	49	0.58	4	174	18	9	53
	MW245	21/09/2020	0089_MW245_200921	Normal	EP2010077	612	612	13.2	11.6	33	6.27	2	167	19	7	36
	MW245	15/12/2020	0089_MW245_201215	Normal	EP2014041	441	441	9.64	9.39	28	1.31	2	136	15	6	28
	MW245	18/03/2021	0089_MW245_210318	Normal	EP2102955	494	494	10.5	9.56	20	4.56	2	142	15	6	25
	MW245	10/06/2021	0089_MW245_210610	Normal	EP2106579	601	601	12.7	12.3	23	1.52	3	187	22	6	24
	MW245	31/08/2021	0089_MW245_210831	Normal	EP2110073	315	315	7.56	8.05	33	3.14	16	118	14	2	22
	MW245	12/01/2022	0089_MW245_220112	Normal	EP2200288	342	342	7.79	6.75	34	7.19	<1	98	10	3	22
	MW245	18/03/2022	0089_MW245_220318	Normal	EP2203194	346	346	7.96	8.22	37	1.64	<2	118	12	5	28
	MW245	9/06/2022	0089_MW245_220609	Normal	EP2207028	460	460	10.2	10.8	30	2.87	7	152	20	8	31
	MW245	6/09/2022	0089_MW245_220906	Normal	EP2211389	304	304	6.83	6.97	21	1.02	8	105	12	2	16
AVCAT Storage	MW249	7/08/2017	0089_MW249_S_170807	Normal	199149	540				300	-2.6		100	36	14	270
	MW249	13/09/2017	0089_MW249_S_170913	Normal	175739											
	MW249	20/10/2017	0089_MW249_S_171020	Normal	178263											
	MW249	21/11/2017	0089_MW249_S_171121	Normal	203587											
	MW249	5/12/2017	0089_MW249_S_171205	Normal	204183											
	MW249	19/01/2018	0089_MW249_S_180119	Normal	205805											
	MW249	8/01/2020	0089_MW249_200108	Normal	EP2000182	470	470	14.0	12.0	124	7.82	54	85	33	11	109
	MW249	30/03/2020	0089_MW249_200330	Normal	EP2003313	398	398	12.6	13.3	124	2.98	54	105	38	11	108
	MW249	16/07/2020	0089_MW249_200716	Normal	EP2007438	433	433	13.3	12.9	103	1.60	86	104	37	10	102
	MW249	16/07/2020	0089_QC110_200716	Field Duplicate	EP2007438	441	441	13.5	12.5	107	3.95	80	99	35	10	101
	MW249	20/07/2020	0089_QC210_200716	nterlab Duplicate	733018					97						
	MW249	21/09/2020	0089_MW249_200921	Normal	EP2010077	465	465	15.1	13.5	168	5.48	51	96	34	11	130
	MW249	21/09/2020	0089_QC109_200921	Field Duplicate	EP2010077	468	468	15.3	13.8	170	5.13	57	98	35	11	133
	MW249	21/09/2020	0089_QC209_200921	nterlab Duplicate	746269					150						
	MW249	15/12/2020	0089_MW249_201215	Normal	EP2014041	449	449	12.3	11.3	103	4.27	22	85	32	9	97
	MW249	15/03/2021	0089_MW249_210315	Normal	EP2102755	418	418	12.6	12.5	130	0.38	29	92	37	11	106
	MW249	9/06/2021	0089_MW249_210609	Normal	EP2106515	435	435	13.4	12.6	150	3.27	25	91	35	10	113
	MW249	31/08/2021	0089_MW249_210831	Normal	EP2110071	426	426	13.5	12.9	130	2.42	64	119	40	3	82
	MW249	12/01/2022	0089_MW249_220112	Normal	EP2200288	431	431	12.8	11.0	118	7.68	40	85	36	7	82
	MW249	17/03/2022	0089_MW249_220317	Normal	EP2203138	418	418	12.7	12.7	116	0.15	51	103	42	10	89
	MW249	8/06/2022	0089_MW249_220608	Normal	EP2206969	444	444	14.3	13.9	151	1.31	56	108	48	11	99
	MW249	6/09/2022	0089_MW249_220906	Normal	EP2211389	444	444	14.3	13.3	139	3.43	71	120	42	2	88
Fire Station	MW255	4/08/2017	0089_MW255_S_170804	Normal	199095	380				100	3.9		130	32	2.6	69
	MW255	13/09/2017	0089_MW255_S_170913	Normal	175739											
	MW255	20/10/2017	0089_MW255_S_171020	Normal	178263											
	MW255	21/11/2017	0089_MW255_S_171121	Normal	203587											
	MW255	8/12/2017	0089_MW255_S_171208	Normal	204353											
	MW255	19/01/2018	0089_MW255_S_180119	Normal	205805											
	MW255	16/07/2020	0089_MW255_200716	Normal	EP2007438	454	454	12.0	10.5	76	6.37	36	117	19	5	69
	MW255	16/07/2020	0089_QC109_200716	Field Duplicate	EP2007438	384	384	10.5	10.3	74	0.96	35	113	19	5	68
	MW255	20/07/2020	0089_QC209_200716	nterlab Duplicate	733018					76						
	MW255	22/09/2020	0089_MW255_200922	Normal	EP2010141	486	486	12.4	10.2	72	9.76	34	103	28	2	63
	MW255	22/09/2020	0089_QC114_200922	Field Duplicate	EP2010141	418	418	11.2	10.4	74	3.50	37	110	25	3	65
	MW255	22/09/2020	0089_QC214_200921	nterlab Duplicate	746269					73						
	MW255	16/12/2020	0089_MW255_201216	Normal	EP2014106	384	384	10.8	10.6	88	0.95	33	116	21	3	70
	MW255	17/03/2021	0089_MW255_210317	Normal	EP2102900	410	410	10.8	9.83	65	4.77	38	106	18	4	68
	MW255	10/06/2021	0089_MW255_210610	Normal	EP2106580	352	352	9.46	9.34	64	0.63	30	98	18	4	66
	MW255	31/08/2021	0089_MW255_210831	Normal	EP2110073	382	382	10.6	10.2	79	1.96	38	106	27	3	61
	MW255	10/01/2022	0089_MW255_220110	Normal	EP2200211	270	270	7.85	7.36	59	3.21	38	82	11	4	52
	MW255	17/03/2022	0089_MW255_220317	Normal	EP2203138	258	258	7.75	8.14	67	2.42	34	92	13	5	54
	MW255	9/06/2022	0089_MW255_220609	Normal	EP2207028	262	262	8.11	8.60	74	2.88	38	97	15	5	55
	MW255	6/09/2022	0089_MW255_220906	Normal	EP2211389	298	298	8.80	8.78	75	0.12	35	91	22	3	54
	MW256	4/08/2017	0089_MW256_S_170804	Normal	199095	340				33	2.3		120	16	1.4	20
	MW256	13/09/2017	0089_MW256_S_170913	Normal	175739											
	MW256	20/10/2017	0089_MW256_S_171020	Normal	178263											
	MW256	21/11/2017	0089_MW256_S_171121	Normal	203587											
	MW256	8/12/2017	0089_MW256_S_171208	Normal	204353											
	MW256	19/01/2018	0089_MW256_S_180119	Normal	205805											
	MW256	30/03/2020	0089_MW256_200330	Normal	EP2003313	358	358	18.0	17.3	352	1.95	46	149	41	4	148

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
Fire Station	MW256	16/07/2020	0089_MW256_200716	Normal	EP2007438	439	439	11.3	11.3	84	0.02	7	152	20	4	45
	MW256	22/09/2020	0089_MW256_200922	Normal	EP2010141	331	331	10.8	9.42	101	6.59	62	112	15	3	58
	MW256	14/12/2020	0089_MW256_201214	Normal	EP2013975	321	321	12.2	12.4	181	0.42	35	126	18	4	103
	MW256	17/03/2021	0089_MW256_210317	Normal	EP2102900	300	300	13.6	12.7	239	3.23	40	111	17	5	130
	MW256	10/06/2021	0089_MW256_210610	Normal	EP2106579	492	492	15.2	15.1	184	0.32	7	150	41	3	95
	MW256	10/06/2021	0089_QC113_210610	Field Duplicate	EP2106579	499	499	14.8	15.6	164	2.86	9	153	41	3	105
	MW256	10/06/2021	0089_QC213_210610	nterlab Duplicate	802734	670	670			88						
	MW256	31/08/2021	0089_MW256_210831	Normal	EP2110064	345	345	19.6	17.3	403	6.27	64	149	27	9	170
	MW256	10/01/2022	0089_MW256_220110	Normal	EP2200211	377	377	17.5	14.3	314	10.2	53	133	26	7	122
	MW256	10/01/2022	0089_QC110_220110	Field Duplicate	EP2200211											
	MW256	10/01/2022	0089_QC210_220110	nterlab Duplicate	854607											
	MW256	17/03/2022	0089_MW256_220317	Normal	EP2203138	473	473	36.2	32.8	867	4.94	109	188	83	8	376
	MW256	9/06/2022	0089_MW256_220609	Normal	EP2207028	516	516	27.8	26.1	585	3.28	49	174	75	8	253
	MW256	6/09/2022	0089_MW256_220906	Normal	EP2211389	430	430	20.0	17.9	372	5.70	46	156	33	8	165
Flammable / hazardous goods and waste storage area	MW257	4/08/2017	0089_MW257_S_170804	Normal	199095	200				20	1.8		74	8.0	0.8	11
	MW257	13/09/2017	0089_MW257_S_170913	Normal	175739											
	MW257	20/10/2017	0089_MW257_S_171020	Normal	178263											
	MW257	21/11/2017	0089_MW257_S_171121	Normal	203587											
	MW257	8/12/2017	0089_MW257_S_171208	Normal	204353											
	MW257	19/01/2018	0089_MW257_S_180119	Normal	205805											
	MW257	19/12/2019	0089_MW257_191219	Normal	EP1913598	144	144	4.45	4.75	47	3.20	12	62	7	3	23
	MW257	2/04/2020	0089_MW257_200402	Normal	EP2003472	175	175	5.15	5.80	49	5.96	13	78	8	3	27
	MW257	16/07/2020	0089_MW257_200716	Normal	EP2007438	178	178	4.48	4.35	26	1.47	9	60	6	3	18
	MW257	22/09/2020	0089_MW257_200922	Normal	EP2010141	159	159	4.10	4.01	26	1.08	9	52	6	2	20
	MW257	16/12/2020	0089_MW257_201216	Normal	EP2014106	180	180	5.07	5.30	42	2.16	14	67	8	3	28
	MW257	18/03/2021	0089_MW257_210318	Normal	EP2102954	193	193	5.36	5.76	43	3.58	14	74	8	4	30
	MW257	9/06/2021	0089_MW257_210609	Normal	EP2106516	158	158	3.77	4.04	16	3.42	8	57	6	2	15
	MW257	31/08/2021	0089_MW257_210831	Normal	EP2110073	111	111	3.24	3.23	29	0.14	10	41	4	3	18
	MW257	10/01/2022	0089_MW257_220110	Normal	EP2200211	197	197	5.47	4.94	39	5.12	21	61	7	4	28
	MW257	17/03/2022	0089_MW257_220317	Normal	EP2203138	180	180	4.93	5.20	37	2.63	14	68	8	4	24
	MW257	9/06/2022	0089_MW257_220609	Normal	EP2207028	368	368	8.18	4.89	19	25.1	14	66	9	3	18
	MW257	6/09/2022	0089_MW257_220906	Normal	EP2211389	115	115	3.18	2.94	27	3.96	6	40	4	2	13
Flammable / hazardous goods and waste storage area	MW258	4/08/2017	0089_MW258_S_170804	Normal	199095	320				110	5.9		120	28	11	83
	MW258	13/09/2017	0089_MW258_S_170913	Normal	175739											
	MW258	20/10/2017	0089_MW258_S_171020	Normal	178263											
	MW258	21/11/2017	0089_MW258_S_171121	Normal	203587											
	MW258	8/12/2017	0089_MW258_S_171208	Normal	204353											
	MW258	19/01/2018	0089_MW258_S_180119	Normal	205805											
	MW258	8/06/2022	0089_MW258_220608	Normal	EP2206971	353	353	11.1	12.7	80	6.51	88	130	33	14	72
	MW258	6/09/2022	0089_MW258_220906	Normal	EP2211389	335	335			120		76	128	27	13	66
Flammable / hazardous goods and waste storage area	MW259	4/08/2017	0089_MW259_S_170804	Normal	199095	260				39	4.7		100	15	4.2	31
	MW259	13/09/2017	0089_MW259_S_170913	Normal	175739											
	MW259	20/10/2017	0089_MW259_S_171020	Normal	178263											
	MW259	21/11/2017	0089_MW259_S_171121	Normal	203587											
	MW259	8/12/2017	0089_MW259_S_171208	Normal	204353											
	MW259	19/01/2018	0089_MW259_S_180119	Normal	205805											
	MW259	16/07/2020	0089_MW259_200716	Normal	EP2007438	232	232	6.06	6.13	38	0.54	17	79	12	6	24
	MW259	22/09/2020	0089_MW259_200922	Normal	EP2010141	238	238	6.22	6.56	41	2.64	15	87	12	4	26
	MW259	16/12/2020	0089_MW259_201216	Normal	EP2014092	291	291	7.20	6.51	39	5.05	14	84	13	3	27
	MW259	18/03/2021	0089_MW259_210318	Normal	EP2102954	206	206	5.40	5.99	33	5.21	17	75	13	2	26
	MW259	10/06/2021	0089_MW259_210610	Normal	EP2106580	224	224	5.84	6.08	36	1.96	17	72	15	3	27
	MW259	31/08/2021	0089_MW259_210831	Normal	EP2110073	207	207	5.37	5.54	38	1.49	8	70	11	2	25
	MW259	11/01/2022	0089_MW259_220111	Normal	EP2200241	170	170	4.08	3.84	20	3.13	6	55	8	<1	10
	MW259	17/03/2022	0089_MW259_220317	Normal	EP2203138	185	185	5.24	5.34	42	1.02	17	61	16	1	22
	MW259	9/06/2022	0089_MW259_220609	Normal	EP2207028	186	186	4.72	4.63	26	0.95	13	57	14	1	14
	MW259	6/09/2022	0089_MW259_220906	Normal	EP2211389	200	200	4.80	4.45	24	3.78	6	62	8	<1	16
Ship sullage area	MW261	12/01/2017	E06_B88_MB01_170112	Normal	530261											
	MW261	4/08/2017	0089_MW261_S_170804	Normal	199095	390				71	1.5		110	30	6.6	55
	MW261	26/09/2019	0089_MW261_190926	Normal	679542											
	MW261	25/10/2019	0089_MW261_191025	Normal	EP1911020							118				
	MW261	19/12/2019	0089_MW261_191219	Normal	EP1913595	404	404	27.0	26.0	569	1.93	137	155	62	23	288
	MW261	19/12/2019	0089_QC102_191219	Field Duplicate	EP1913595	410	410	27.0	25.7	563	2.52	143	154	60	24	287
	MW261	19/12/2019	0089_QC202_191219	nterlab Duplicate	695528	2,800				56						
	MW261	30/03/2020	0089_MW261_200330	Normal	EP2003313	444	444	27.9	27.6	573	0.61	139	166	67	29	300
	MW261	21/07/2020	0089_MW261_200721	Normal	EP2007611	437	437	28.8	27.6	578	2.15	179	168	61	26	310
	MW261	22/09/2020	0089_MW261_200922	Normal	EP2010141	470	470	26.2	23.3	529	5.97	93	138	51	25	266
	MW261	16/12/2020	0089_MW261_201216	Normal	EP2014087	416	416	29.3	28.4	617	1.58	172	148	62	28	349
	MW261	18/03/2021	0089_MW261_210318	Normal	EP2102954	396	396	30.2	29.2	668	1.85	168	145	61	28	372
	MW261	9/06/2021	0089_MW261_210609	Normal	EP2106516	408	408	29.0	28.5	615	0.88	167	143	59	27	363
	MW261	31/08/2021	0089_MW261_210831	Normal	EP2110073	422	422	25.0	22.1	502	6.03	115	134	42	22	263
	MW261	11/01/2022	0089_MW261_220111	Normal	EP2200241	337	337	11.5	9.66	119	8.60	67	94	15	17	76
	MW261	17/03/2022	0089_MW261_220317	Normal	EP2203138	415	415	14.3	13.6	152	2.64	83	108	20	14	142
Dredge spoil	MW268	1/08/2017	0089_MW268_S_170801	Normal	198918	500				3,000	3.4		200	270	70	1,900
	MW268	19/09/2017	0089_MW268_S_170919	Normal	176140											
	MW268	16/10/2017	0089_MW268_S_171016	Normal	177956											
	MW268	17/11/2017	0089_MW268_S_171117	Normal	203443											
	MW268	7/12/2017	0089_MW268_S_171207	Normal	204323											
	MW268	16/01/2018	0089_MW268_S_180116	Normal	205631											
	MW268	19/12/2019	0089_MW268_191219	Normal	EP1913595	458	458	50.0	48.5	974	1.49	642	173	164	32	588
	MW268	30/03/2020	0089_MW268_200330	Normal	EP2003313	563	563	66.4	69.3	1,520	2.09	592	178	200	65	972
	MW268	21/07/2020	0089_MW268_200721	Normal	EP2007611	536	536	89.1	87.1	2,340	1.14	595	187	222	81	1,320
	MW268	21/09/2020	0089_MW268_200921	Normal	EP2010085	460	460	77.6	87.0	1,940	5.69	660	197	228	74	1,300
	MW268	14/12/2020	0089_MW268_201214	Normal	EP2013975	436	436	101	109	2,780	3.83	664	197	273	91	1,710
	MW268	16/03/2021	0089_MW268_210316	Normal	EP2102837	421	421	116	119	3,270	1.54	730	206	292	116	1,890

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
	MW268	16/03/2021	0089_QC116_210316	Field Duplicate	EP2102837	399	399	143	145	4,220	0.80	772	222	326	121	2,400
	MW268	16/03/2021	0089_QC216_210316	nterlab Duplicate	781350	460				3,100						
	MW268	9/06/2021	0089_MW268_210609	Normal	EP2106515	413	413	130	128	3,770	0.45	728	211	302	107	2,080
	MW268	31/08/2021	0089_MW268_210831	Normal	EP2110073	474	474	61.1	63.9	1,250	2.24	788	205	211	50	806
	MW268	11/01/2022	0089_MW268_220111	Normal	EP2200241	411	411	45.1	44.6	667	0.52	868	210	204	19	388
	MW268	17/03/2022	0089_MW268_220317	Normal	EP2203138	445	445	53.2	53.3	1,020	0.14	746	210	201	36	584
	MW268	9/06/2022	0089_MW268_220609	Normal	EP2207028	463	463	109	110	3,010	0.26	726	214	285	103	1,680
	MW268	6/09/2022	0089_MW268_220906	Normal	EP2211390	458	458	61.1	65.4	1,340	3.36	680	190	208	51	861
	MW269	1/08/2017	0089_MW269_S_170801	Normal	198918	370				270	3.4		90	40	13	220
	MW269	19/09/2017	0089_MW269_S_170919	Normal	176140											
	MW269	16/10/2017	0089_MW269_S_171016	Normal	177956											
	MW269	17/11/2017	0089_MW269_S_171117	Normal	203443											
	MW269	7/12/2017	0089_MW269_S_171207	Normal	204323											
	MW269	16/01/2018	0089_MW269_S_180116	Normal	205631											
	MW269	19/12/2019	0089_MW269_191219	Normal	EP1913595	384	384	16.6	14.9	251	5.48	89	52	42	17	193
	MW269	30/03/2020	0089_MW269_200330	Normal	EP2003313	377	377	17.5	16.6	297	2.76	77	71	47	18	200
	MW269	21/07/2020	0089_MW269_200721	Normal	EP2007611	450	450	20.0	18.1	324	4.85	89	68	58	19	218
Dredge spoil	MW269	21/09/2020	0089_MW269_200921	Normal	EP2010085	404	404	15.9	15.2	222	2.17	74	74	49	15	163
	MW269	14/12/2020	0089_MW269_201214	Normal	EP2013975	390	390	17.4	16.6	284	2.32	76	73	52	16	190
	MW269	16/03/2021	0089_MW269_210316	Normal	EP2102837	464	464	23.9	25.1	444	2.54	101	88	82	22	309
	MW269	9/06/2021	0089_MW269_210609	Normal	EP2106515	443	443	24.1	21.5	470	5.69	98	73	66	20	275
	MW269	31/08/2021	0089_MW269_210831	Normal	EP2110073	424	424	21.7	19.2	404	5.92	87	77	58	18	234
	MW269	11/01/2022	0089_MW269_220111	Normal	EP2200241	386	386	18.0	15.7	287	6.80	106	98	47	12	153
	MW269	17/03/2022	0089_MW269_220317	Normal	EP2203138	413	413	17.4	16.2	258	3.53	91	90	50	16	166
	MW269	9/06/2022	0089_MW269_220609	Normal	EP2207028	419	419	19.1	17.8	303	3.41	103	76	67	16	186
	MW269	6/09/2022	0089_MW269_220906	Normal	EP2211390	384	384	17.7	16.4	285	3.90	96	68	58	15	180
	MW282	11/09/2017	0089_MW282_S_170911	Normal	175533											
	MW282	16/10/2017	0089_MW282_S_171016	Normal	177956											
	MW282	17/11/2017	0089_MW282_S_171117	Normal	203443											
	MW282	5/12/2017	0089_MW282_S_171205	Normal	204183											
	MW282	15/01/2018	0089_MW282_S_180115	Normal	205568											
	MW282	19/12/2019	0089_MW282_191219	Normal	EP1913595	510	510	12.1	12.4	50	1.37	25	176	25	2	36
	MW282	19/12/2019	0089_QC101_191219	Field Duplicate	EP1913595	478	478	11.5	12.3	50	3.45	26	175	24	2	36
	MW282	31/03/2020	0089_MW282_200331	Normal	EP2003366	562	562	14.0	16.3	76	7.82	29	216	38	2	55
Helicopter Support Facility	MW282	22/07/2020	0089_MW282_200722	Normal	EP2007667	565	565	13.7	12.3	72	5.38	17	161	19	1	61
	MW282	24/09/2020	0089_MW282_200924	Normal	EP2010273	490	490	12.5	11.9	84	2.24	16	154	19	<1	62
	MW282	15/12/2020	0089_MW282_201215	Normal	EP2014041	526	526	12.5	13.8	57	4.74	19	187	26	1	52
	MW282	18/03/2021	0089_MW282_210318	Normal	EP2102955	632	632	15.8	16.8	102	2.74	17	222	33	<1	68
	MW282	9/06/2021	0089_MW282_210609	Normal	EP2106514	571	571	14.4	15.0	89	1.94	24	195	30	2	63
	MW282	31/08/2021	0089_MW282_210831	Normal	EP2110064	492	492	11.3	10.3	40	4.51	17	148	20	<1	30
	MW282	13/01/2022	0089_MW282_220113	Normal	EP2200339	515	515	12.0	11.9	51	0.51	14	176	22	<1	30
	MW282	17/03/2022	0089_MW282_220317	Normal	EP2203138	544	544	13.0	14.2	62	4.44	20	208	25	1	41
	MW282	8/06/2022	0089_MW282_220608	Normal	EP2206971	535	535	12.5	14.4	54	7.06	16	211	26	<1	41
	MW282	8/09/2022	0089_MW282_220908	Normal	EP2211535	445	445	9.64	8.94	17	3.80	13	137	16	<1	18
	MW288	18/09/2017	0089_MW288_S_170918	Normal	176030											
	MW288	17/10/2017	0089_MW288_S_171017	Normal	177985											
	MW288	15/11/2017	0089_MW288_S_171115	Normal	203378											
	MW288	7/12/2017	0089_MW288_S_171207	Normal	204323											
	MW288	15/01/2018	0089_MW288_S_180115	Normal	205568											
Accommodation area	MW288	15/07/2020	0089_MW288_200715	Normal	EP2007385	270	270	11.6	11.0	176	2.49	60	77	29	8	106
	MW288	17/03/2021	0089_MW288_210317	Normal	EP2102900	213	213	9.79	10.3	124	2.42	98	57	31	9	107
	MW288	31/08/2021	0089_MW288_210831	Normal	EP2110071											
	MW288	12/01/2022	0089_MW288_220112	Normal	EP2200288	254	254	7.74	8.35	53	3.81	56	84	22	5	51
	MW288	18/03/2022	0089_MW288_220318	Normal	EP2203194	244	244	7.68	8.75	56	6.50	59	97	24	6	41
	MW288	8/06/2022	0089_MW288_220608	Normal	EP2206971	271	271	7.85	9.88	54	11.4	44	121	24	5	40
	MW288	6/09/2022	0089_MW288_220906	Normal	EP2211390	316	316	8.63	8.76	52	0.76	41	92	22	4	52
	MW289	18/09/2017	0089_MW289_S_170918	Normal	176030											
	MW289	17/10/2017	0089_MW289_S_171017	Normal	177985											
	MW289	15/11/2017	0089_MW289_S_171115	Normal	203378											
	MW289	7/12/2017	0089_MW289_S_171207	Normal	204323											
	MW289	15/01/2018	0089_MW289_S_180115	Normal	205568											
	MW289	30/03/2020	0089_MW289_200330	Normal	EP2003313	293	293	11.5	12.2	163	2.72	52	128	28	2	79
	MW289	22/07/2020	0089_MW289_200722	Normal	EP2007667	319	319	10.7	11.4	107	2.92	65	114	28	7	74
	MW289	21/09/2020	0089_MW289_200921	Normal	EP2010077	328	328	9.71	9.81	53	0.49	80	92	27	10	63
	MW289	21/09/2020	0089_QC101_200921	Field Duplicate	EP2010077	338	338	10.0	9.85	58	0.81	78	88	27	11	68
Accommodation area	MW289	21/09/2020	0089_QC201_200921	nterlab Duplicate	746269	580	590			53						
	MW289	15/12/2020	0089_MW289_201215	Normal	EP2014042	321	321	9.02	9.56	46	2.90	63	94	25	8	60
	MW289	16/03/2021	0089_MW289_210316	Normal	EP2102837	318	318	8.72	9.76	41	5.64	58	109	24	5	51
	MW289	9/06/2021	0089_MW289_210609	Normal	EP2106516	344	344	10.1	10.7	65	2.84	66	93	30	10	76
	MW289	30/08/2021	0089_MW289_210830	Normal	EP2110016	308	308	9.18	10.6	68	7.26	53	119	27	4	54
	MW289	30/08/2021	0089_QC103_210830	Field Duplicate	EP2110016	290	290	8.87	10.1	67	6.50	57	109	25	5	57
	MW289	30/08/2021	0089_QC203_210830	nterlab Duplicate	820919											
	MW289	13/01/2022	0089_MW289_220113	Normal	EP2200340	358	358	11.7	13.2	110	6.09	71	136	33	9	81
	MW289	17/03/2022	0089_MW289_220317	Normal	EP2203138	422	422	13.0	14.4	101	5.14	82	153	32	10	89
	MW289	8/06/2022	0089_MW289_220608	Normal	EP2206969	396	396	12.2	12.8	99	2.47	70	135	28	5	83
	MW289	5/09/2022	0089_MW289_220905	Normal	EP2211345	306	306	9.22	9.07	79	0.82	42	82	20	6	73
	MW500	10/01/2022	0089_MW500_220110	Normal	EP2200214	295	295	6.86	5.96	24	7.04	14	89	10	<1	16
	MW500	10/01/2022	0089_QC105_220110	Field Duplicate	EP2200214											
Fire Training Area	MW500	10/01/2022	0089_QC205_220110	nterlab Duplicate	854607											
	MW500	14/03/2022	0089_MW500_220314	Normal	EP2202975	432	432	10.1	10.1	26	0.15	35	149	18	4	24
	MW500	7/06/2022	0089_MW500_220607	Normal	EP2206880	408	408	9.92	9.26	40	3.45	31	136	17	3	23
	MW500	5/09/2022	0089_MW500_220905	Normal	EP2211343	303	303	7.41	6.96	34	3.12	19	98	13	<1	23

						Inorganics										
						Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water																
PFAS NEMP 2020 Interim Marine 99%																
PFAS NEMP 2020 Recreational Water																
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**											
AVCAT Storage	MW516	30/03/2020	0089_MW247_200330	Normal	EP2003313	436	436	13.8	14.4	138	2.35	56	104	55	16	99
	MW516	21/07/2020	0089_MW247_200721	Normal	EP2007611	512	512	19.8	18.7	252	3.06	120	137	55	20	156
	MW516	21/09/2020	0089_MW516_200921	Normal	EP2010077	557	557	16.9	15.6	159	4.06	62	139	46	15	103
	MW516	16/12/2020	0089_MW516_201216	Normal	EP2014087	542	542	15.6	15.6	140	0.02	42	156	40	12	98
	MW516	18/03/2021	0089_MW516_210318	Normal	EP2102954	460	460	13.5	14.1	131	2.22	28	144	33	12	89
	MW516	9/06/2021	0089_MW516_210609	Normal	EP2106515	499	499	15.8	15.5	149	0.90	79	147	40	15	104
	MW516	31/08/2021	0089_MW516_210831	Normal	EP2110073	522	522	24.0	24.4	356	0.93	168	225	58	23	180
	MW516	12/01/2022	0089_MW516_220112	Normal	EP2200288	482	482	13.9	12.8	122	4.36	42	108	42	11	84
	MW516	17/03/2022	0089_MW516_220317	Normal	EP2203138	468	468	16.7	16.0	180	1.90	108	128	51	20	114
	MW516	8/06/2022	0089_MW516_220608	Normal	EP2206969	483	483	15.2	15.7	143	1.74	71	130	52	16	104
	MW516	6/09/2022	0089_MW516_220906	Normal	EP2211389	501	501	21.4	20.8	284	1.57	164	138	71	22	172

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

Cardno now Stantec

Table 2 - Pore water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
Waste water Treatment Plant	PW304	17/04/2018	0089_PW304_180417	Normal	209522		<0.001	<0.001	0.005	<0.001	0.020	<0.002	0.033	0.10	0.10	0.003	0.003	<0.001	<0.002	<0.002
	PW304	8/01/2020	0089_PW304_200108	Normal	EP2000186		<0.02	<0.02	<0.02	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	1/04/2020	0089_PW304_200401	Normal	EP2003438		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	1/04/2020	0089_QC101_200401	Field Duplicate	EP2003438		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	1/04/2020	0089_QC201_200401	Interlab Duplicate	711709		<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW304	20/07/2020	0089_PW304_200720	Normal	EP2007544		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	22/09/2020	0089_PW304_200922	Normal	EP2010143		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	15/12/2020	0089_PW304_201215	Normal	EP2014048		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	15/03/2021	0089_PW304_210315	Normal	EP2102755		<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	10/06/2021	0089_PW304_210610	Normal	EP2106582		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	1/09/2021	0089_PW304_210901	Normal	EP2110155		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	11/01/2022	0089_PW304_220111	Normal	EP2200240		<0.02	<0.02	<0.01	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	18/03/2022	0089_PW304_220318	Normal	EP2203195		<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	8/06/2022	0089_PW304_220608	Normal	EP2206973		<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW304	5/09/2022	0089_PW304_220905	Normal	EP2211344		<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW306	18/04/2018	0089_PW306_180418	Normal	209573		<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW306	10/01/2020	0089_PW306_200110	Normal	EP2000293		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	31/03/2020	0089_PW306_200331	Normal	EP2003366		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	22/07/2020	0089_PW306_200722	Normal	EP2007648		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	23/09/2020	0089_PW306_200923	Normal	EP2010220		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	15/12/2020	0089_PW306_201215	Normal	EP2014048		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	17/03/2021	0089_PW306_210317	Normal	EP2102892		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	9/06/2021	0089_PW306_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	31/08/2021	0089_PW306_210831	Normal	EP2110072		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	13/01/2022	0089_PW306_220113	Normal	EP2200338		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	16/03/2022	0089_PW306_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	7/06/2022	0089_PW306_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW306	6/09/2022	0089_PW306_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW307	30/04/2018	0089_PW307_180430	Normal	209959		<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW307	10/01/2020	0089_PW307_200110	Normal	EP2000293		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	31/03/2020	0089_PW307_200331	Normal	EP2003366		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	22/07/2020	0089_PW307_200722	Normal	EP2007648		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	23/09/2020	0089_PW307_200923	Normal	EP2010220		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	15/12/2020	0089_PW307_201215	Normal	EP2014053		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	17/03/2021	0089_PW307_210317	Normal	EP2102892		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	9/06/2021	0089_PW307_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	31/08/2021	0089_PW307_210831	Normal	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	13/01/2022	0089_PW307_220113	Normal	EP2200338		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	16/03/2022	0089_PW307_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	7/06/2022	0089_PW307_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW307	6/09/2022	0089_PW307_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW308	30/04/2018	0089_PW308_180430	Normal	209959		<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW308	10/01/2020	0089_PW308_200110	Normal	EP2000293		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	1/04/2020	0089_PW308_200401	Normal	EP2003417		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	22/07/2020	0089_PW308_200722	Normal	EP2007648		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	23/09/2020	0089_PW308_200923	Normal	EP2010217		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	15/12/2020	0089_PW308_201215	Normal	EP2014053		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	17/03/2021	0089_PW308_210317	Normal	EP2102892		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	9/06/2021	0089_PW308_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	31/08/2021	0089_PW308_210831	Normal	EP2110072		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	13/01/2022	0089_PW308_220113	Normal	EP2200338		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	16/03/2022	0089_PW308_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	7/06/2022	0089_PW308_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW308	6/09/2022	0089_PW308_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	18/04/2018	0089_PW314_180418	Normal	209573		<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW314	10/01/2020	0089_PW314_200110	Normal	EP2000293		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	31/03/2020	0089_PW314_200331	Normal	EP2003366		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 2 - Pore water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
Helicopter Support Facility	PW314	22/07/2020	0089_PW314_200722	Normal	EP2007648		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	23/09/2020	0089_PW314_200923	Normal	EP2010220		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	15/12/2020	0089_PW314_201215	Normal	EP2014048		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	17/03/2021	0089_PW314_210317	Normal	EP2102892		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	9/06/2021	0089_PW314_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	31/08/2021	0089_PW314_210831	Normal	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	13/01/2022	0089_PW314_220113	Normal	EP2200338		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	16/03/2022	0089_PW314_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	7/06/2022	0089_PW314_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW314	6/09/2022	0089_PW314_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW315	30/04/2018	0089_PW315_180430	Normal	209959		<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW315	10/01/2020	0089_PW315_200110	Normal	EP2000293		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	1/04/2020	0089_PW315_200401	Normal	EP2003417		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	22/07/2020	0089_PW315_200722	Normal	EP2007648		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	23/09/2020	0089_PW315_200923	Normal	EP2010217		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	15/12/2020	0089_PW315_201215	Normal	EP2014048		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	17/03/2021	0089_PW315_210317	Normal	EP2102892		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	9/06/2021	0089_PW315_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	31/08/2021	0089_PW315_210831	Normal	EP2110072		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	31/08/2021	0089_QC116_210831	Field Duplicate	EP2110072		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	31/08/2021	0089_QC216_210831	Interlab Duplicate	821197		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW315	12/01/2022	0089_QC219_220113	Interlab Duplicate	855202		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW315	13/01/2022	0089_PW315_220113	Normal	EP2200338		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	13/01/2022	0089_QC119_220113	Field Duplicate	EP2200338		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	16/03/2022	0089_PW315_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	7/06/2022	0089_PW315_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	7/06/2022	0089_QC104_220607	Field Duplicate	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW315	7/06/2022	0089_QC204_220607	Interlab Duplicate	896805		<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001
	PW315	6/09/2022	0089_PW315_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW316	30/04/2018	0089_PW316_180430	Normal	209959		<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW316	10/01/2020	0089_PW316_200110	Normal	EP2000293		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	1/04/2020	0089_PW316_200401	Normal	EP2003417		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	22/07/2020	0089_PW316_200722	Normal	EP2007648		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	23/09/2020	0089_PW316_200923	Normal	EP2010217		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	15/12/2020	0089_PW316_201215	Normal	EP2014053		<0.02	<0.02	<0.02	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	17/03/2021	0089_PW316_210317	Normal	EP2102892		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	9/06/2021	0089_PW316_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	31/08/2021	0089_PW316_210831	Normal	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	13/01/2022	0089_PW316_220113	Normal	EP2200338		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	16/03/2022	0089_PW316_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	7/06/2022	0089_PW316_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW316	6/09/2022	0089_PW316_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Demolition Ground	PW329	12/04/2018	0089_PW329_180412	Normal	209345		<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW329	10/01/2020	0089_PW329_200110	Normal	EP2000252		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	30/03/2020	0089_PW329_200330	Normal	EP2003308		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	20/07/2020	0089_PW329_200720	Normal	EP2007544		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	23/09/2020	0089_PW329_200923	Normal	EP2010217		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	14/12/2020	0089_PW329_201214	Normal	EP2013973		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	14/12/2020	0089_QC102_201214	Field Duplicate	EP2013973		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	14/12/2020	0089_QC202_201114	Interlab Duplicate	765054		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW329	16/03/2021	0089_PW329_210316	Normal	EP2102836		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	16/03/2021	0089_QC110_210316	Field Duplicate	EP2102836		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	16/03/2021	0089_QC210_210316	Interlab Duplicate	781350		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW329	8/06/2021	0089_PW329_210608	Normal	EP2106465		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	8/06/2021	0089_QC103_210608	Field Duplicate	EP2106465		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	8/06/2021	0089_QC203_210608	Interlab Duplicate	802464		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW329	30/08/2021	0089_PW329_210830	Normal	EP2110017		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 2 - Pore water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
	PW329	10/01/2022	0089_PW329_220110	Normal	EP2200218		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	10/01/2022	0089_QC108_220110	Field Duplicate	EP2200218		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	10/01/2022	0089_QC208_220110	Interlab Duplicate	854607		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW329	15/03/2022	0089_PW329_220315	Normal	EP2203019		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	15/03/2022	0089_QC116_220315	Field Duplicate	EP2203019		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	15/03/2022	0089_QC216_220315	Interlab Duplicate	872903		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW329	8/06/2022	0089_PW329_220608	Normal	EP2206970		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW329	5/09/2022	0089_PW329_220905	Normal	EP2211347		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Demolition Ground	PW330	12/04/2018	0089_PW330_180412	Normal	209345		<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW330	10/01/2020	0089_PW330_200110	Normal	EP2000252		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	30/03/2020	0089_PW330_200330	Normal	EP2003308		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	20/07/2020	0089_PW330_200720	Normal	EP2007544		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	22/09/2020	0089_PW330_200922	Normal	EP2010151		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	14/12/2020	0089_PW330_201214	Normal	EP2013989		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	16/03/2021	0089_PW330_210316	Normal	EP2102836		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	8/06/2021	0089_PW330_210608	Normal	EP2106465		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	30/08/2021	0089_PW330_210830	Normal	EP2110017		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	10/01/2022	0089_PW330_220110	Normal	EP2200218		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	15/03/2022	0089_PW330_220315	Normal	EP2203019		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	8/06/2022	0089_PW330_220608	Normal	EP2206970		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	8/06/2022	0089_QC117_220608	Field Duplicate	EP2206970		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW330	8/06/2022	0089_QC217_220608	Interlab Duplicate	896805		<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001
	PW330	5/09/2022	0089_PW330_220905	Normal	EP2211347		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Demolition Ground	PW331	12/04/2018	0089_PW331_180412	Normal	209345		<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW331	10/01/2020	0089_PW331_200110	Normal	EP2000252		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	30/03/2020	0089_PW331_200330	Normal	EP2003308		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	20/07/2020	0089_PW331_200720	Normal	EP2007544		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	23/09/2020	0089_PW331_200923	Normal	EP2010220		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	14/12/2020	0089_PW331_201214	Normal	EP2013973		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	14/12/2020	0089_QC104_201214	Field Duplicate	EP2013973		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	14/12/2020	0089_QC204_201114	Interlab Duplicate	765054		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW331	16/03/2021	0089_PW331_210316	Normal	EP2102836		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	8/06/2021	0089_PW331_210608	Normal	EP2106465		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	30/08/2021	0089_PW331_210830	Normal	EP2110017		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	10/01/2022	0089_PW331_220110	Normal	EP2200218		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	15/03/2022	0089_PW331_220315	Normal	EP2203019		<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	15/03/2022	0089_QC114_220315	Field Duplicate	EP2203019		<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	15/03/2022	0089_QC214_220315	Interlab Duplicate	872903		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW331	8/06/2022	0089_PW331_220608	Normal	EP2206970		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	8/06/2022	0089_QC118_220608	Field Duplicate	EP2206970		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	8/06/2022	0089_QC218_220608	Interlab Duplicate	896805		<0.002	<0.002	<0.002	<0.002	0.006	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001
	PW331	5/09/2022	0089_PW331_220905	Normal	EP2211347		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	5/09/2022	0089_QC106_220905	Field Duplicate	EP2211347		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW331	5/09/2022	0089_QC206_220905	Interlab Duplicate	920981		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	PW335	13/04/2018	0089_PW335_180413	Normal	209417		<0.001	<0.001	0.001	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW335	13/04/2018	0089_QC1PW_180413	Field Duplicate	209417		<0.001	<0.001	0.004	0.001	0.011	<0.002	0.004	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW335	13/04/2018	0089_QC2PW_180413	Interlab Duplicate	594110		<0.001	<0.001	0.005	<0.001	0.011	<0.001	0.005	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
	PW335	13/04/2018	0089_QC2PW_180413	Interlab Duplicate	594110		<0.001	<0.001	0.006	<0.001	0.011	<0.001	0.005	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
	PW335	9/01/2020	0089_PW335_200109	Normal	EP2000249		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	30/03/2020	0089_PW335_200330	Normal	EP2003333		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	15/07/2020	0089_PW335_200715	Normal	EP2007383		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	15/07/2020	0089_QC104_200715	Field Duplicate	EP2007383		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	15/07/2020	0089_QC204_200215	Interlab Duplicate	732844		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW335	22/09/2020	0089_PW335_200922	Normal	EP2010151		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	14/12/2020	0089_PW335_201214	Normal	EP2013985		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	14/12/2020	0089_QC105_201214	Field Duplicate	EP2013985		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	14/12/2020	0089_QC205_201114	Interlab Duplicate	765054		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Table 2 - Pore water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*			
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19			
PFAS NEMP 2020 Recreational Water																**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Fire Training Area	PW335	15/03/2021	0089_PW335_210315	Normal	EP2102752	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	8/06/2021	0089_PW335_210608	Normal	EP2106465	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	30/08/2021	0089_PW335_210830	Normal	EP2110021	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	10/01/2022	0089_PW335_220110	Normal	EP2200215	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	14/03/2022	0089_PW335_220314	Normal	EP2202977	<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	7/06/2022	0089_PW335_220607	Normal	EP2206881	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW335	5/09/2022	0089_PW335_220905	Normal	EP2211344	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	13/04/2018	0089_PW340_180413	Normal	209417	<0.001	<0.001	0.001	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW340	9/01/2020	0089_PW340_200109	Normal	EP2000249	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	30/03/2020	0089_PW340_200330	Normal	EP2003333	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	30/03/2020	0089_QC107_200330	Field Duplicate	EP2003333	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	30/03/2020	0089_QC207_200330	Interlab Duplicate	711144	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW340	15/07/2020	0089_PW340_200715	Normal	EP2007383	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	22/09/2020	0089_PW340_200922	Normal	EP2010151	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	14/12/2020	0089_PW340_201214	Normal	EP2013988	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	15/03/2021	0089_PW340_210315	Normal	EP2102752	<0.02	<0.02	<0.02	<0.02	0.28	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	8/06/2021	0089_PW340_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	30/08/2021	0089_PW340_210830	Normal	EP2110021	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	10/01/2022	0089_PW340_220110	Normal	EP2200215	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	14/03/2022	0089_PW340_220314	Normal	EP2202977	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	7/06/2022	0089_PW340_220607	Normal	EP2206881	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW340	5/09/2022	0089_PW340_220905	Normal	EP2211344	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	13/04/2018	0089_PW341_180413	Normal	209417	<0.001	<0.001	0.004	<0.001	0.004	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW341	8/01/2020	0089_PW341_200108	Normal	EP2000179	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	8/01/2020	0089_QC106_200108	Field Duplicate	EP2000179	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	8/01/2020	0089_QC206_200108	Interlab Duplicate	696100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW341	31/03/2020	0089_PW341_200331	Normal	EP2003364	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	15/07/2020	0089_PW341_200715	Normal	EP2007383	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	22/09/2020	0089_PW341_200922	Normal	EP2010151	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	22/09/2020	0089_QC115_200922	Field Duplicate	EP2010151	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	22/09/2020	0089_QC215_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW341	14/12/2020	0089_PW341_201214	Normal	EP2013988	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	15/03/2021	0089_PW341_210315	Normal	EP2102752	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	8/06/2021	0089_PW341_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	30/08/2021	0089_PW341_210830	Normal	EP2110021	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	10/01/2022	0089_PW341_220110	Normal	EP2200212	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	14/03/2022	0089_PW341_220314	Normal	EP2202977	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	7/06/2022	0089_PW341_220607	Normal	EP2206881	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW341	5/09/2022	0089_PW341_220905	Normal	EP2211344	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste wate Treatment Plant	PW345	13/04/2018	0089_PW345_180413	Normal	209417	0.021	0.020	0.11	0.004	0.034	<0.002	0.027	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW345	9/01/2020	0089_PW345_200109	Normal	EP2000249	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	31/03/2020	0089_PW345_200331	Normal	EP2003374	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	24/09/2020	0089_PW345_200924	Normal	EP2010271	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	15/12/2020	0089_PW345_201215	Normal	EP2014053	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	16/03/2021	0089_PW345_210316	Normal	EP2102834	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	9/06/2021	0089_PW345_210609	Normal	EP2106517	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	1/09/2021	0089_PW345_210901	Normal	EP2110154	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	10/01/2022	0089_PW345_220110	Normal	EP2200215	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	10/01/2022	0089_QC111_220110	Field Duplicate	EP2200215	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	10/01/2022	0089_QC211_220110	Interlab Duplicate	854607	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW345	14/03/2022	0089_PW345_220314	Normal	EP2202977	<0.02	<0.02	<0.01	<0.02	0.19	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	7/06/2022	0089_PW345_220607	Normal	EP2206884	<0.02	<0.02	0.03	<0.02	0.47	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW345	5/09/2022	0089_PW345_220905	Normal	EP2211341	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW346	17/04/2018	0089_PW346_180417	Normal	209522	<0.001	<0.001	0.006	<0.001	0.013	<0.002	0.005	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002
	PW346	8/01/2020	0089_PW346_200108	Normal	EP2000186	0.03	0.04	0.38	0.03	1.85	<0.02	<0.1	<0.02	0.05	<0.02	0.02	<0.02	<0.02	<0.02
	PW346	1/04/2020	0089_PW346_200401	Normal	EP2003438	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW346	15/07/2020	0089_PW346_200715	Normal	EP2007386	<0.02	<0.02	0.03	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 2 - Pore water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*			
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19			
PFAS NEMP 2020 Recreational Water																**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Accommodation Area	PW346	22/09/2020	0089_PW346_200922	Normal	EP2010143	0.06	0.06	0.65	0.06	4.97	<0.02	<0.1	0.02	0.10	0.03	0.06	0.05	<0.02	<0.02
	PW346	15/12/2020	0089_PW346_201215	Normal	EP2014044	0.07	0.07	0.45	0.03	2.71	<0.02	<0.1	<0.02	0.10	<0.02	0.03	<0.02	<0.02	<0.02
	PW346	17/03/2021	0089_PW346_210317	Normal	EP2102901	0.03	<0.02	0.07	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW346	10/06/2021	0089_PW346_210610	Normal	EP2106580	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW346	30/08/2021	0089_PW346_210830	Normal	EP2110017	<0.02	<0.02	0.05	<0.02	0.34	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW346	12/01/2022	0089_PW346_220112	Normal	EP2200289	0.04	0.03	0.25	<0.02	1.84	<0.02	<0.1	<0.02	0.05	<0.02	0.02	<0.02	<0.02	<0.02
	PW346	18/03/2022	0089_PW346_220318	Normal	EP2203195	0.04	0.06	0.64	<0.02	1.12	<0.02	<0.1	<0.02	0.08	<0.02	<0.01	<0.02	<0.02	<0.02
	PW346	8/06/2022	0089_PW346_220608	Normal	EP2206973	<0.02	<0.02	0.06	<0.02	0.42	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02
	PW346	6/09/2022	0089_PW346_220906	Normal	EP2211391	<0.02	<0.02	0.04	<0.02	0.11	<0.02	<0.1	0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste water Treatment Plant	PW350	19/04/2018	0089_PW350_180419	Normal	209623	0.94	0.64	4.3	0.27	0.14	<0.002	0.16	0.25	1.4	0.13	0.27	<0.001	<0.002	<0.002
	PW350	30/01/2020	0089_PW350_200130	Normal	EP2001003	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	2/04/2020	0089_PW350_200402	Normal	EP2003476	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	21/07/2020	0089_PW350_200721	Normal	EP2007594	<0.02	<0.02	0.02	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	23/09/2020	0089_PW350_200923	Normal	EP2010220	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	16/12/2020	0089_PW350_201216	Normal	EP2014090	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	17/03/2021	0089_PW350_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	8/06/2021	0089_PW350_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	30/08/2021	0089_PW350_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	11/01/2022	0089_PW350_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	14/03/2022	0089_PW350_220314	Normal	EP2202980	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	7/06/2022	0089_PW350_220607	Normal	EP2206884	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW350	7/09/2022	0089_PW350_220907	Normal	EP2211496	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste water Treatment Plant	PW351	19/04/2018	0089_PW351_180419	Normal	209623	0.25	0.11	0.21	0.001	0.006	<0.002	0.027	0.040	0.10	0.003	<0.001	<0.001	<0.002	<0.002
	PW351	30/01/2020	0089_PW351_200130	Normal	EP2001003	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	2/04/2020	0089_PW351_200402	Normal	EP2003474	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	21/07/2020	0089_PW351_200721	Normal	EP2007594	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	23/09/2020	0089_PW351_200923	Normal	EP2010220	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	16/12/2020	0089_PW351_201216	Normal	EP2014090	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	17/03/2021	0089_PW351_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	8/06/2021	0089_PW351_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	30/08/2021	0089_PW351_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	11/01/2022	0089_PW351_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	14/03/2022	0089_PW351_220314	Normal	EP2202980	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	7/06/2022	0089_PW351_220607	Normal	EP2206881	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW351	7/09/2022	0089_PW351_220907	Normal	EP2211496	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste water Treatment Plant	PW352	19/04/2018	0089_PW352_180419	Normal	209623	0.13	0.043	0.034	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW352	30/01/2020	0089_PW352_200130	Normal	EP2001003	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	2/04/2020	0089_PW352_200402	Normal	EP2003476	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	21/07/2020	0089_PW352_200721	Normal	EP2007594	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	23/09/2020	0089_PW352_200923	Normal	EP2010220	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	16/12/2020	0089_PW352_201216	Normal	EP2014090	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	17/03/2021	0089_PW352_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	8/06/2021	0089_PW352_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	30/08/2021	0089_PW352_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	11/01/2022	0089_PW352_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	14/03/2022	0089_PW352_220314	Normal	EP2202980	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	7/06/2022	0089_PW352_220607	Normal	EP2206884	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW352	7/09/2022	0089_PW352_220907	Normal	EP2211496	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Demolition Ground	PW356	12/04/2018	0089_PW356_180412	Normal	209345	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW356	12/04/2018	0089_QC6PW_180412	Field Duplicate	209345	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW356	12/04/2018	0089_QC7PW_180412	Interlab Duplicate	594110	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
	PW356	9/01/2020	0089_QC202_200109	Interlab Duplicate	696324	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW356	10/01/2020	0089_PW356_200110	Normal	EP2000252	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	10/01/2020	0089_QC102_200110	Field Duplicate	EP2000252	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	30/03/2020	0089_PW356_200330	Normal	EP2003308	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	20/07/2020	0089_PW356_200720	Normal	EP2007544	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	23/09/2020	0089_PW356_200923	Normal	EP2010220	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 2 - Pore water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
	PW356	14/12/2020	0089_PW356_201214	Normal	EP2013973		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	16/03/2021	0089_PW356_210316	Normal	EP2102836		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	8/06/2021	0089_PW356_210608	Normal	EP2106465		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	30/08/2021	0089_PW356_210830	Normal	EP2110021		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	10/01/2022	0089_PW356_220110	Normal	EP2200218		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	15/03/2022	0089_PW356_220315	Normal	EP2203019		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	8/06/2022	0089_PW356_220608	Normal	EP2206970		<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW356	5/09/2022	0089_PW356_220905	Normal	EP2211347		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	12/04/2018	0089_PW357_180412	Normal	209345		<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW357	9/01/2020	0089_QC203_200109	Interlab Duplicate	696324		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW357	10/01/2020	0089_PW357_200110	Normal	EP2000252		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	10/01/2020	0089_QC103_200110	Field Duplicate	EP2000252		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	30/03/2020	0089_PW357_200330	Normal	EP2003308		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	20/07/2020	0089_PW357_200720	Normal	EP2007544		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	23/09/2020	0089_PW357_200923	Normal	EP2010220		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	14/12/2020	0089_PW357_201214	Normal	EP2013989		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Demolition Ground	PW357	16/03/2021	0089_PW357_210316	Normal	EP2102836		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	8/06/2021	0089_PW357_210608	Normal	EP2106465		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	30/08/2021	0089_PW357_210830	Normal	EP2110017		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	10/01/2022	0089_PW357_220110	Normal	EP2200218		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	15/03/2022	0089_PW357_220315	Normal	EP2203019		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	15/03/2022	0089_QC118_220315	Field Duplicate	EP2203019		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	15/03/2022	0089_QC218_220315	Interlab Duplicate	872903		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW357	8/06/2022	0089_PW357_220608	Normal	EP2208241		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW357	5/09/2022	0089_PW357_220905	Normal	EP2211347		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	12/04/2018	0089_PW358_180412	Normal	209345		<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW358	10/01/2020	0089_PW358_200110	Normal	EP2000252		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	30/03/2020	0089_PW358_200330	Normal	EP2003308		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	20/07/2020	0089_PW358_200720	Normal	EP2007544		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	23/09/2020	0089_PW358_200923	Normal	EP2010217		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	14/12/2020	0089_PW358_201214	Normal	EP2013989		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	16/03/2021	0089_PW358_210316	Normal	EP2102836		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	16/03/2021	0089_QC113_210316	Field Duplicate	EP2102836		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Demolition Ground	PW358	16/03/2021	0089_QC213_210316	Interlab Duplicate	781350		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW358	8/06/2021	0089_PW358_210608	Normal	EP2106465		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	8/06/2021	0089_QC107_210608	Field Duplicate	EP2106465		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	8/06/2021	0089_QC207_210608	Interlab Duplicate	802464		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW358	30/08/2021	0089_PW358_210830	Normal	EP2110017		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	10/01/2022	0089_PW358_220110	Normal	EP2200218		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	15/03/2022	0089_PW358_220315	Normal	EP2203019		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	8/06/2022	0089_PW358_220608	Normal	EP2206970		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW358	5/09/2022	0089_PW358_220905	Normal	EP2211347		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	13/04/2018	0089_PW362_180413	Normal	209417		<0.001	<0.001	0.006	<0.001	0.009	<0.002	0.003	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW362	8/01/2020	0089_PW362_200108	Normal	EP2000179		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	31/03/2020	0089_PW362_200331	Normal	EP2003364		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	15/07/2020	0089_PW362_200715	Normal	EP2007383		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	22/09/2020	0089_PW362_200922	Normal	EP2010151		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	14/12/2020	0089_PW362_201214	Normal	EP2013988		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	15/03/2021	0089_PW362_210315	Normal	EP2102758		<0.02	<0.02	<0.02	<0.02	0.23	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	8/06/2021	0089_PW362_210608	Normal	EP2106450		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Fire Training Area	PW362	30/08/2021	0089_PW362_210830	Normal	EP2110021		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	10/01/2022	0089_PW362_220110	Normal	EP2200212		<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	14/03/2022	0089_PW362_220314	Normal	EP2202977		<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	7/06/2022	0089_PW362_220607	Normal	EP2206881		<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	7/06/2022	0089_QC110_220607	Field Duplicate	EP2206881		<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	7/06/2022	0089_QC210_220607	Interlab Duplicate	896805		<0.002	<0.002	0.003	<0.002	0.028	<0.004	<0.008	<0.002	<0.001	<0.004	0.001	<0.002	<0.001	<0.001
	PW362	5/09/2022	0089_PW362_220905	Normal	EP2211344		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 2 - Pore water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
	PW362	5/09/2022	0089_QC108_220905	Field Duplicate	EP2211344		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW362	5/09/2022	0089_QC208_220905	Interlab Duplicate	920981		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Training Area	PW363	13/04/2018	0089_PW363_180413	Normal	209417		<0.001	<0.001	0.004	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW363	8/01/2020	0089_PW363_200108	Normal	EP2000179		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	31/03/2020	0089_PW363_200331	Normal	EP2003364		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	15/07/2020	0089_PW363_200715	Normal	EP2007383		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	22/09/2020	0089_PW363_200922	Normal	EP2010151		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	14/12/2020	0089_PW363_201214	Normal	EP2013988		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	15/03/2021	0089_PW363_210315	Normal	EP2102752		<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	8/06/2021	0089_PW363_210608	Normal	EP2106450		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	30/08/2021	0089_PW363_210830	Normal	EP2110021		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	10/01/2022	0089_PW363_220110	Normal	EP2200212		<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	14/03/2022	0089_PW363_220314	Normal	EP2202977		<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	7/06/2022	0089_PW363_220607	Normal	EP2206881		<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW363	5/09/2022	0089_PW363_220905	Normal	EP2211344		<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Fire Training Area	PW364	13/04/2018	0089_PW364_180413	Normal	209417		<0.001	<0.001	0.006	<0.001	0.017	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW364	9/01/2020	0089_PW364_200109	Normal	EP2000249		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	30/03/2020	0089_PW364_200330	Normal	EP2003333		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	30/03/2020	0089_QC105_200330	Field Duplicate	EP2003333		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	30/03/2020	0089_QC205_200330	Interlab Duplicate	711144		<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW364	15/07/2020	0089_PW364_200715	Normal	EP2007383		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	22/09/2020	0089_PW364_200922	Normal	EP2010151		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	14/12/2020	0089_PW364_201214	Normal	EP2013985		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	15/03/2021	0089_PW364_210315	Normal	EP2102755		<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	8/06/2021	0089_PW364_210608	Normal	EP2106465		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	30/08/2021	0089_PW364_210830	Normal	EP2110021		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	30/08/2021	0089_QC106_210830	Field Duplicate	EP2110021		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	30/08/2021	0089_QC206_210830	Interlab Duplicate	820919		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW364	10/01/2022	0089_PW364_220110	Normal	EP2200215		<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	14/03/2022	0089_PW364_220314	Normal	EP2202977		<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	14/03/2022	0089_QC101_220314	Field Duplicate	EP2202977		<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	14/03/2022	0089_QC201_220314	Interlab Duplicate	872911		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW364	7/06/2022	0089_PW364_220607	Normal	EP2206881		<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW364	5/09/2022	0089_PW364_220905	Normal	EP2211344		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste water Treatment Plant	PW367	17/04/2018	0089_PW367_180417	Normal	209522		0.016	<0.001	0.003	0.001	0.042	<0.002	0.01	<0.002	0.003	<0.001	0.003	0.001	<0.002	<0.002
	PW367	8/01/2020	0089_PW367_200108	Normal	EP2000186		<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	31/03/2020	0089_PW367_200331	Normal	EP2003374		<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	15/07/2020	0089_PW367_200715	Normal	EP2007383		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	22/09/2020	0089_PW367_200922	Normal	EP2010143		<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	15/12/2020	0089_PW367_201215	Normal	EP2014048		<0.02	<0.02	<0.02	<0.02	0.13	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	15/03/2021	0089_PW367_210315	Normal	EP2102758		<0.02	<0.02	<0.02	<0.02	0.01	0.03	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	9/06/2021	0089_PW367_210609	Normal	EP2106517		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	1/09/2021	0089_PW367_210901	Normal	EP2110155		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	11/01/2022	0089_QC113_220111	Field Duplicate	EP2200240		<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	11/01/2022	0089_QC213_220111	Interlab Duplicate	855202		<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW367	11/01/2022	0089-PW367_220111	Normal	EP2200240		<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	14/03/2022	0089_PW367_220314	Normal	EP2202977		<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	7/06/2022	0089_PW367_220607	Normal	EP2206884		<0.02	<0.02	0.03	<0.02	0.27	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	5/09/2022	0089_PW367_220905	Normal	EP2211341		<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	5/09/2022	0089_QC110_220905	Field Duplicate	EP2211341		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW367	5/09/2022	0089_QC210_220905	Interlab Duplicate	920981		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW368	17/04/2018	0089_PW368_180417	Normal	209522		0.003	0.002	0.014	0.001	0.040	<0.002	0.026	0.006	0.016	0.003	0.009	<0.001	<0.002	<0.002
	PW368	8/01/2020	0089_PW368_200108	Normal	EP2000186		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	1/04/2020	0089_PW368_200401	Normal	EP2003438		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	1/04/2020	0089_QC102_200401	Field Duplicate	EP2003438		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	1/04/2020	0089_QC202_200401	Interlab Duplicate	711709		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW368	20/07/2020	0089_PW368_200720	Normal	EP2007544		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 2 - Pore water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
Waste water Treatment Plant	PW368	22/09/2020	0089_PW368_200922	Normal	EP2010143		<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	15/12/2020	0089_PW368_201215	Normal	EP2014048		<0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	15/03/2021	0089_PW368_210315	Normal	EP2102758		<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	15/03/2021	0089_QC102_210315	Field Duplicate	EP2102758		<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	15/03/2021	0089_QC202_210315	Interlab Duplicate	781350		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW368	10/06/2021	0089_PW368_210610	Normal	EP2106582		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	1/09/2021	0089_PW368_210901	Normal	EP2110155		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	11/01/2022	0089_PW368_220111	Normal	EP2200240		<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	18/03/2022	0089_PW368_220318	Normal	EP2203195		<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	8/06/2022	0089_PW368_220608	Normal	EP2206973		<0.02	<0.02	0.06	<0.02	0.27	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	5/09/2022	0089_PW368_220905	Normal	EP2211344		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	5/09/2022	0089_QC118_220905	Field Duplicate	EP2211344		<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW368	5/09/2022	0089_QC218_220905	Interlab Duplicate	920981		<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW369	17/04/2018	0089_PW369_180417	Normal	209522		<0.001	<0.001	0.019	0.002	0.018	<0.002	0.01	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW369	9/01/2020	0089_PW369_200109	Normal	EP2000249		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	31/03/2020	0089_PW369_200331	Normal	EP2003374		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	15/07/2020	0089_PW369_200715	Normal	EP2007383		<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	24/09/2020	0089_PW369_200924	Normal	EP2010271		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	15/12/2020	0089_PW369_201215	Normal	EP2014053		<0.02	<0.02	0.09	<0.02	0.60	<0.02	<0.1	<0.02	0.05	0.02	0.08	<0.02	<0.02	<0.02
	PW369	16/03/2021	0089_PW369_210316	Normal	EP2102834		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	9/06/2021	0089_PW369_210609	Normal	EP2106517		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	1/09/2021	0089_PW369_210901	Normal	EP2110154		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	1/09/2021	0089_QC118_210901	Field Duplicate	EP2110154		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	1/09/2021	0089_QC218_210901	Interlab Duplicate	822579		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW369	10/01/2022	0089_PW369_220110	Normal	EP2200215		<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	14/03/2022	0089_PW369_220314	Normal	EP2202977		<0.02	<0.02	<0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	7/06/2022	0089_PW369_220607	Normal	EP2206884		<0.02	<0.02	0.03	<0.02	0.17	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW369	5/09/2022	0089_PW369_220905	Normal	EP2211341		<0.02	<0.02	<0.01	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Dredge Spoil and Careening Bay	PW374	18/04/2018	0089_PW374_180418	Normal	209573		0.006	0.005	0.021	<0.001	0.007	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002
	PW374	8/01/2020	0089_PW374_200108	Normal	EP2000186		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	8/01/2020	0089_QC108_200108	Field Duplicate	EP2000186		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	8/01/2020	0089_QC208_200108	Interlab Duplicate	696100		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW374	30/03/2020	0089_PW374_200330	Normal	EP2003313		<0.02	<0.02	<0.02	<0.02	0.44	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	21/07/2020	0089_PW374_200721	Normal	EP2007611		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	21/09/2020	0089_PW374_200921	Normal	EP2010085		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	21/09/2020	0089_QC103_200921	Field Duplicate	EP2010085		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	21/09/2020	0089_QC203_200921	Interlab Duplicate	746269		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW374	14/12/2020	0089_PW374_201214	Normal	EP2013989		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	15/03/2021	0089_PW374_210315	Normal	EP2102758		<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	15/03/2021	0089_QC106_210315	Field Duplicate	EP2102758		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	15/03/2021	0089_QC206_210315	Interlab Duplicate	781350		<0.01	<0.01	0.07	<0.01	0.04	<0.01	<0.05	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01
	PW374	10/06/2021	0089_PW374_210610	Normal	EP2106582		<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	1/09/2021	0089_PW374_210901	Normal	EP2110154		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	13/01/2022	0089_PW374_220113	Normal	EP2200343		<0.02	<0.02	<0.01	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	16/03/2022	0089_PW374_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	9/06/2022	0089_PW374_220609	Normal	EP2207029		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW374	6/09/2022	0089_PW374_220906	Normal	EP2211391		<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Dredge Spoil and Careening Bay	PW375	18/04/2018	0089_PW375_180418	Normal	209573		0.010	0.007	0.011	<0.001	0.003	<0.002	0.006	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	PW375	8/01/2020	0089_PW375_200108	Normal	EP2000186		<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	30/03/2020	0089_PW375_200330	Normal	EP2003313		<0.02	<0.02	<0.02	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	21/07/2020	0089_PW375_200721	Normal	EP2007611		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	21/09/2020	0089_PW375_200921	Normal	EP2010085		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	14/12/2020	0089_PW375_201214	Normal	EP2013989		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	14/12/2020	0089_QC109_201214	Field Duplicate	EP2013989		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	14/12/2020	0089_QC209_201114	Interlab Duplicate	765054		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW375	15/03/2021	0089_PW375_210315	Normal	EP2102758		<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	10/06/2021	0089_PW375_210610	Normal	EP2106582		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 2 - Pore water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*			
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19			
PFAS NEMP 2020 Recreational Water																**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	PW375	10/06/2021	0089_QC118_210610	Field Duplicate	EP2106582	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	10/06/2021	0089_QC218_210610	Interlab Duplicate	802734	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW375	1/09/2021	0089_PW375_210901	Normal	EP2110154	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	13/01/2022	0089_PW375_220113	Normal	EP2200343	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	16/03/2022	0089_PW375_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	9/06/2022	0089_PW375_220609	Normal	EP2207029	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW375	6/09/2022	0089_PW375_220906	Normal	EP2211391	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Dredge Spoil and Careening Bay	PW378	17/04/2018	0089_PW378_180417	Normal	209522	0.016	0.013	0.020	<0.001	0.007	<0.002	0.024	0.01	0.081	0.005	0.005	<0.001	<0.002	<0.002
	PW378	8/01/2020	0089_PW378_200108	Normal	EP2000186	<0.02	<0.02	<0.02	<0.02	0.12	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	30/03/2020	0089_PW378_200330	Normal	EP2003313	<0.02	<0.02	<0.02	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	21/07/2020	0089_PW378_200721	Normal	EP2007611	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	21/09/2020	0089_PW378_200921	Normal	EP2010085	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	14/12/2020	0089_PW378_201214	Normal	EP2013989	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	15/03/2021	0089_PW378_210315	Normal	EP2102758	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	10/06/2021	0089_PW378_210610	Normal	EP2106582	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	1/09/2021	0089_PW378_210901	Normal	EP2110154	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	13/01/2022	0089_PW378_220113	Normal	EP2200343	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	16/03/2022	0089_PW378_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	9/06/2022	0089_PW378_220609	Normal	EP2207029	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW378	6/09/2022	0089_PW378_220906	Normal	EP2211391	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste water Treatment Plant	PW380	19/04/2018	0089_PW380_180419	Normal	209623	0.83	0.54	0.86	0.004	0.008	<0.002	0.11	0.16	0.68	0.016	0.001	<0.001	<0.002	<0.002
	PW380	30/01/2020	0089_PW380_200130	Normal	EP2001003	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	2/04/2020	0089_PW380_200402	Normal	EP2003476	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	21/07/2020	0089_PW380_200721	Normal	EP2007594	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	23/09/2020	0089_PW380_200923	Normal	EP2010217	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	16/12/2020	0089_PW380_201216	Normal	EP2014090	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	17/03/2021	0089_PW380_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	8/06/2021	0089_PW380_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	30/08/2021	0089_PW380_210830	Normal	EP2110017	<0.02	<0.02	0.06	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	11/01/2022	0089_PW380_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	14/03/2022	0089_PW380_220314	Normal	EP2202980	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	7/06/2022	0089_PW380_220607	Normal	EP2206881	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW380	7/09/2022	0089_PW380_220907	Normal	EP2211496	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste water Treatment Plant	PW381	19/04/2018	0089_PW381_180419	Normal	209623	0.48	0.28	1.4	0.010	0.006	<0.002	0.11	0.21	0.57	0.012	0.004	<0.001	<0.002	<0.002
	PW381	30/01/2020	0089_PW381_200130	Normal	EP2001003	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	2/04/2020	0089_PW381_200402	Normal	EP2003474	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	21/07/2020	0089_PW381_200721	Normal	EP2007594	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	23/09/2020	0089_PW381_200923	Normal	EP2010217	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	16/12/2020	0089_PW381_201216	Normal	EP2014104	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	17/03/2021	0089_PW381_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	8/06/2021	0089_PW381_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	30/08/2021	0089_PW381_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	11/01/2022	0089_PW381_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	14/03/2022	0089_PW381_220314	Normal	EP2202980	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	7/06/2022	0089_PW381_220607	Normal	EP2206884	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW381	7/09/2022	0089_PW381_220907	Normal	EP2211496	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste water Treatment Plant	PW401	19/04/2018	0089_PW379_180419	Normal	209623	0.88	0.61	3.6	0.079	0.040	<0.002	0.17	0.24	1.6	0.096	0.032	<0.001	<0.002	<0.002
	PW401	30/01/2020	0089_PW401_200130	Normal	EP2001003	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	2/04/2020	0089_PW401_200402	Normal	EP2003474	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	21/07/2020	0089_PW401_200721	Normal	EP2007594	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	23/09/2020	0089_PW401_200923	Normal	EP2010220	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	16/12/2020	0089_PW401_201216	Normal	EP2014090	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	17/03/2021	0089_PW401_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	8/06/2021	0089_PW401_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	30/08/2021	0089_PW401_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	11/01/2022	0089_PW401_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	14/03/2022	0089_PW401_220314	Normal	EP2202980	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 2 - Pore water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
	PW401	7/06/2022	0089_PW401_220607	Normal	EP2206881		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW401	7/09/2022	0089_PW401_220907	Normal	EP2211496		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW405	14/01/2020	0089_PW405_200114	Normal	EP2000432		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	1/04/2020	0089_PW405_200401	Normal	EP2003417		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	22/07/2020	0089_PW405_200722	Normal	EP2007648		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	21/09/2020	0089_PW405_200921	Normal	EP2010085		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	21/09/2020	0089_QC110_200921	Field Duplicate	EP2010085		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	21/09/2020	0089_QC210_200921	Interlab Duplicate	746269		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW405	15/12/2020	0089_PW405_201215	Normal	EP2014048		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	15/03/2021	0089_PW405_210315	Normal	EP2102752		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	10/06/2021	0089_PW405_210610	Normal	EP2106590		<0.02	0.03	<0.02	<0.02	<0.01	<0.02	<0.1	0.05	0.06	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	10/06/2021	0089_QC115_210610	Field Duplicate	EP2106590		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	0.05	0.07	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	10/06/2021	0089_QC215_210610	Interlab Duplicate	802734		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	0.05	0.06	<0.01	<0.01	<0.01	<0.01	<0.01
	PW405	31/08/2021	0089_PW405_210831	Normal	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	31/08/2021	0089_QC117_210831	Field Duplicate	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	31/08/2021	0089_QC217_210831	Interlab Duplicate	821197		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
	PW405	14/01/2022	0089_PW405_220114	Normal	EP2200400		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	16/03/2022	0089_PW405_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.03	0.05	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	7/06/2022	0089_PW405_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW405	7/09/2022	0089_PW405_220907	Normal	EP2211496		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW407	14/01/2020	0089_PW407_200114	Normal	EP2000432		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	1/04/2020	0089_PW407_200401	Normal	EP2003417		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.1	0.83	0.51	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	22/07/2020	0089_PW407_200722	Normal	EP2007648		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	21/09/2020	0089_PW407_200921	Normal	EP2010085		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	15/12/2020	0089_PW407_201215	Normal	EP2014053		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	15/03/2021	0089_PW407_210315	Normal	EP2102752		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	10/06/2021	0089_PW407_210610	Normal	EP2106590		<0.02	<0.02	<0.02	<0.02	<0.01	0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	31/08/2021	0089_PW407_210831	Normal	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	14/01/2022	0089_PW407_220114	Normal	EP2200400		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	16/03/2022	0089_PW407_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	7/06/2022	0089_PW407_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW407	7/09/2022	0089_PW407_220907	Normal	EP2211498		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW409	14/01/2020	0089_PW409_200114	Normal	EP2000432		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	1/04/2020	0089_PW409_200401	Normal	EP2003417		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	21/07/2020	0089_PW409_200721	Normal	EP2007611		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	22/09/2020	0089_PW409_200922	Normal	EP2010143		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	22/09/2020	0089_QC113_200922	Field Duplicate	EP2010143		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	22/09/2020	0089_QC213_200921	Interlab Duplicate	746269		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PW409	15/12/2020	0089_PW409_201215	Normal	EP2014044		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	17/03/2021	0089_PW409_210317	Normal	EP2102901		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	10/06/2021	0089_PW409_210610	Normal	EP2106590		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	31/08/2021	0089_PW409_210831	Normal	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	14/01/2022	0089_PW409_220114	Normal	EP2200400		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	16/03/2022	0089_PW409_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	7/06/2022	0089_PW409_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW409	6/09/2022	0089_PW409_220906	Normal	EP2211391		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW411	14/01/2020	0089_PW411_200114	Normal	EP2000432		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	1/04/2020	0089_PW411_200401	Normal	EP2003417		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	21/07/2020	0089_PW411_200721	Normal	EP2007611		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	22/09/2020	0089_PW411_200922	Normal	EP2010143		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	15/12/2020	0089_PW411_201215	Normal	EP2014044		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	18/03/2021	0089_PW411_210318	Normal	EP2102956		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	9/06/2021	0089_PW411_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	1/09/2021	0089_PW411_210901	Normal	EP2110154		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	14/01/2022	0089_PW411_220114	Normal	EP2200400		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	16/03/2022	0089_PW411_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW411	7/06/2022	0089_PW411_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 2 - Pore water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
	PW411	6/09/2022	0089_PW411_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW413	14/01/2020	0089_PW413_200114	Normal	EP2000432		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	1/04/2020	0089_PW413_200401	Normal	EP2003417		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	21/07/2020	0089_PW413_200721	Normal	EP2007611		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	22/09/2020	0089_PW413_200922	Normal	EP2010143		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	15/12/2020	0089_PW413_201215	Normal	EP2014044		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	18/03/2021	0089_PW413_210318	Normal	EP2102941		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	9/06/2021	0089_PW413_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	1/09/2021	0089_PW413_210901	Normal	EP2110155		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	14/01/2022	0089_PW413_220114	Normal	EP2200400		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	16/03/2022	0089_PW413_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	7/06/2022	0089_PW413_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW413	6/09/2022	0089_PW413_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	PW415	14/01/2020	0089_PW415_200114	Normal	EP2000432		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	1/04/2020	0089_PW415_200401	Normal	EP2003417		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	21/07/2020	0089_PW415_200721	Normal	EP2007611		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	22/09/2020	0089_PW415_200922	Normal	EP2010145		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	15/12/2020	0089_PW415_201215	Normal	EP2014044		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	18/03/2021	0089_PW415_210318	Normal	EP2102941		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	9/06/2021	0089_PW415_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	1/09/2021	0089_PW415_210901	Normal	EP2110155		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	14/01/2022	0089_PW415_220114	Normal	EP2200400		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	16/03/2022	0089_PW415_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	7/06/2022	0089_PW415_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	PW415	6/09/2022	0089_PW415_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
						Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																			
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Waste water Treatment Plant	PW304	17/04/2018	0089_PW304_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW304	8/01/2020	0089_PW304_200108	Normal	EP2000186	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	1/04/2020	0089_PW304_200401	Normal	EP2003438	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	1/04/2020	0089_QC101_200401	Field Duplicate	EP2003438	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	1/04/2020	0089_QC201_200401	Interlab Duplicate	711709	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW304	20/07/2020	0089_PW304_200720	Normal	EP2007544	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	22/09/2020	0089_PW304_200922	Normal	EP2010143	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	15/12/2020	0089_PW304_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	15/03/2021	0089_PW304_210315	Normal	EP2102755	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	10/06/2021	0089_PW304_210610	Normal	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	1/09/2021	0089_PW304_210901	Normal	EP2110155	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	11/01/2022	0089_PW304_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	18/03/2022	0089_PW304_220318	Normal	EP2203195	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	8/06/2022	0089_PW304_220608	Normal	EP2206973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW304	5/09/2022	0089_PW304_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW306	18/04/2018	0089_PW306_180418	Normal	209573	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW306	10/01/2020	0089_PW306_200110	Normal	EP2000293	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	31/03/2020	0089_PW306_200331	Normal	EP2003366	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	22/07/2020	0089_PW306_200722	Normal	EP2007648	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	23/09/2020	0089_PW306_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	15/12/2020	0089_PW306_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	17/03/2021	0089_PW306_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	9/06/2021	0089_PW306_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	31/08/2021	0089_PW306_210831	Normal	EP2110072	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	13/01/2022	0089_PW306_220113	Normal	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	16/03/2022	0089_PW306_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	7/06/2022	0089_PW306_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW306	6/09/2022	0089_PW306_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW307	30/04/2018	0089_PW307_180430	Normal	209959	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW307	10/01/2020	0089_PW307_200110	Normal	EP2000293	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	31/03/2020	0089_PW307_200331	Normal	EP2003366	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	22/07/2020	0089_PW307_200722	Normal	EP2007648	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	23/09/2020	0089_PW307_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	15/12/2020	0089_PW307_201215	Normal	EP2014053	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	17/03/2021	0089_PW307_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	9/06/2021	0089_PW307_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	31/08/2021	0089_PW307_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	13/01/2022	0089_PW307_220113	Normal	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	16/03/2022	0089_PW307_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	7/06/2022	0089_PW307_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW307	6/09/2022	0089_PW307_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW308	30/04/2018	0089_PW308_180430	Normal	209959	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW308	10/01/2020	0089_PW308_200110	Normal	EP2000293	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	1/04/2020	0089_PW308_200401	Normal	EP2003417	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	22/07/2020	0089_PW308_200722	Normal	EP2007648	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	23/09/2020	0089_PW308_200923	Normal	EP2010217	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	15/12/2020	0089_PW308_201215	Normal	EP2014053	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	17/03/2021	0089_PW308_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	9/06/2021	0089_PW308_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	31/08/2021	0089_PW308_210831	Normal	EP2110072	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	13/01/2022	0089_PW308_220113	Normal	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	16/03/2022	0089_PW308_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	7/06/2022	0089_PW308_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW308	6/09/2022	0089_PW308_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	18/04/2018	0089_PW314_180418	Normal	209573	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW314	10/01/2020	0089_PW314_200110	Normal	EP2000293	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	31/03/2020	0089_PW314_200331	Normal	EP2003366	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
						Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																			
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Helicopter Support Facility	PW314	22/07/2020	0089_PW314_200722	Normal	EP2007648	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	23/09/2020	0089_PW314_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	15/12/2020	0089_PW314_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	17/03/2021	0089_PW314_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	9/06/2021	0089_PW314_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	31/08/2021	0089_PW314_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	13/01/2022	0089_PW314_220113	Normal	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	16/03/2022	0089_PW314_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	7/06/2022	0089_PW314_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW314	6/09/2022	0089_PW314_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW315	30/04/2018	0089_PW315_180430	Normal	209959	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW315	10/01/2020	0089_PW315_200110	Normal	EP2000293	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	1/04/2020	0089_PW315_200401	Normal	EP2003417	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	22/07/2020	0089_PW315_200722	Normal	EP2007648	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	23/09/2020	0089_PW315_200923	Normal	EP2010217	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	15/12/2020	0089_PW315_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	17/03/2021	0089_PW315_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	9/06/2021	0089_PW315_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	31/08/2021	0089_PW315_210831	Normal	EP2110072	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	31/08/2021	0089_QC116_210831	Field Duplicate	EP2110072	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	31/08/2021	0089_QC216_210831	Interlab Duplicate	821197	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW315	12/01/2022	0089_QC219_220113	Interlab Duplicate	855202	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW315	13/01/2022	0089_PW315_220113	Normal	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	13/01/2022	0089_QC119_220113	Field Duplicate	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	16/03/2022	0089_PW315_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	7/06/2022	0089_PW315_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	7/06/2022	0089_QC104_220607	Field Duplicate	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW315	7/06/2022	0089_QC204_220607	Interlab Duplicate	896805	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008
	PW315	6/09/2022	0089_PW315_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW316	30/04/2018	0089_PW316_180430	Normal	209959	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW316	10/01/2020	0089_PW316_200110	Normal	EP2000293	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	1/04/2020	0089_PW316_200401	Normal	EP2003417	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	22/07/2020	0089_PW316_200722	Normal	EP2007648	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	23/09/2020	0089_PW316_200923	Normal	EP2010217	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	15/12/2020	0089_PW316_201215	Normal	EP2014053	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	17/03/2021	0089_PW316_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	9/06/2021	0089_PW316_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	31/08/2021	0089_PW316_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	13/01/2022	0089_PW316_220113	Normal	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	16/03/2022	0089_PW316_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	7/06/2022	0089_PW316_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW316	6/09/2022	0089_PW316_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	PW329	12/04/2018	0089_PW329_180412	Normal	209345	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW329	10/01/2020	0089_PW329_200110	Normal	EP2000252	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	30/03/2020	0089_PW329_200330	Normal	EP2003308	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	20/07/2020	0089_PW329_200720	Normal	EP2007544	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	23/09/2020	0089_PW329_200923	Normal	EP2010217	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	14/12/2020	0089_PW329_201214	Normal	EP2013973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	14/12/2020	0089_QC102_201214	Field Duplicate	EP2013973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	14/12/2020	0089_QC202_201114	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW329	16/03/2021	0089_PW329_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	16/03/2021	0089_QC110_210316	Field Duplicate	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	16/03/2021	0089_QC210_210316	Interlab Duplicate	781350	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW329	8/06/2021	0089_PW329_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	8/06/2021	0089_QC103_210608	Field Duplicate	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	8/06/2021	0089_QC203_210608	Interlab Duplicate	802464	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW329	30/08/2021	0089_PW329_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW329	10/01/2022	0089_PW329_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	10/01/2022	0089_QC108_220110	Field Duplicate	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	10/01/2022	0089_QC208_220110	Interlab Duplicate	854607	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW329	15/03/2022	0089_PW329_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	15/03/2022	0089_QC116_220315	Field Duplicate	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	15/03/2022	0089_QC216_220315	Interlab Duplicate	872903	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW329	8/06/2022	0089_PW329_220608	Normal	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW329	5/09/2022	0089_PW329_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	PW330	12/04/2018	0089_PW330_180412	Normal	209345	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW330	10/01/2020	0089_PW330_200110	Normal	EP2000252	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	30/03/2020	0089_PW330_200330	Normal	EP2003308	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	20/07/2020	0089_PW330_200720	Normal	EP2007544	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	22/09/2020	0089_PW330_200922	Normal	EP2010151	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	14/12/2020	0089_PW330_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	16/03/2021	0089_PW330_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	8/06/2021	0089_PW330_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	30/08/2021	0089_PW330_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	10/01/2022	0089_PW330_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	15/03/2022	0089_PW330_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	8/06/2022	0089_PW330_220608	Normal	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	8/06/2022	0089_QC117_220608	Field Duplicate	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW330	8/06/2022	0089_QC217_220608	Interlab Duplicate	896805	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008
	PW330	5/09/2022	0089_PW330_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	PW331	12/04/2018	0089_PW331_180412	Normal	209345	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW331	10/01/2020	0089_PW331_200110	Normal	EP2000252	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	30/03/2020	0089_PW331_200330	Normal	EP2003308	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	20/07/2020	0089_PW331_200720	Normal	EP2007544	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	23/09/2020	0089_PW331_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	14/12/2020	0089_PW331_201214	Normal	EP2013973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	14/12/2020	0089_QC104_201214	Field Duplicate	EP2013973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	14/12/2020	0089_QC204_201114	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW331	16/03/2021	0089_PW331_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	8/06/2021	0089_PW331_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	30/08/2021	0089_PW331_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	10/01/2022	0089_PW331_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	15/03/2022	0089_PW331_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	15/03/2022	0089_QC114_220315	Field Duplicate	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	15/03/2022	0089_QC214_220315	Interlab Duplicate	872903	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW331	8/06/2022	0089_PW331_220608	Normal	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	8/06/2022	0089_QC118_220608	Field Duplicate	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	8/06/2022	0089_QC218_220608	Interlab Duplicate	896805	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008
	PW331	5/09/2022	0089_PW331_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	5/09/2022	0089_QC106_220905	Field Duplicate	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW331	5/09/2022	0089_QC206_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	PW335	13/04/2018	0089_PW335_180413	Normal	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW335	13/04/2018	0089_QC1PW_180413	Field Duplicate	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW335	13/04/2018	0089_QC2PW_180413	Interlab Duplicate	594110	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	PW335	13/04/2018	0089_QC2PW_180413	Interlab Duplicate	594110	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	PW335	9/01/2020	0089_PW335_200109	Normal	EP2000249	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	30/03/2020	0089_PW335_200330	Normal	EP2003333	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	15/07/2020	0089_PW335_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	15/07/2020	0089_QC104_200715	Field Duplicate	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	15/07/2020	0089_QC204_200215	Interlab Duplicate	732844	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW335	22/09/2020	0089_PW335_200922	Normal	EP2010151	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	14/12/2020	0089_PW335_201214	Normal	EP2013985	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	14/12/2020	0089_QC105_201214	Field Duplicate	EP2013985	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	14/12/2020	0089_QC205_201114	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW335	15/03/2021	0089_PW335_210315	Normal	EP2102752	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	8/06/2021	0089_PW335_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	30/08/2021	0089_PW335_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	10/01/2022	0089_PW335_220110	Normal	EP2200215	<0.02	<0.02	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	14/03/2022	0089_PW335_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	7/06/2022	0089_PW335_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW335	5/09/2022	0089_PW335_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Fire Training Area	PW340	13/04/2018	0089_PW340_180413	Normal	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW340	9/01/2020	0089_PW340_200109	Normal	EP2000249	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	30/03/2020	0089_PW340_200330	Normal	EP2003333	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	30/03/2020	0089_QC107_200330	Field Duplicate	EP2003333	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	30/03/2020	0089_QC207_200330	Interlab Duplicate	711144	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW340	15/07/2020	0089_PW340_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	22/09/2020	0089_PW340_200922	Normal	EP2010151	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	14/12/2020	0089_PW340_201214	Normal	EP2013988	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	15/03/2021	0089_PW340_210315	Normal	EP2102752	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	8/06/2021	0089_PW340_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	30/08/2021	0089_PW340_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	10/01/2022	0089_PW340_220110	Normal	EP2200215	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	14/03/2022	0089_PW340_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	7/06/2022	0089_PW340_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW340	5/09/2022	0089_PW340_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Fire Training Area	PW341	13/04/2018	0089_PW341_180413	Normal	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW341	8/01/2020	0089_PW341_200108	Normal	EP2000179	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	8/01/2020	0089_QC106_200108	Field Duplicate	EP2000179	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	8/01/2020	0089_QC206_200108	Interlab Duplicate	696100	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW341	31/03/2020	0089_PW341_200331	Normal	EP2003364	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	15/07/2020	0089_PW341_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	22/09/2020	0089_PW341_200922	Normal	EP2010151	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	22/09/2020	0089_QC115_200922	Field Duplicate	EP2010151	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	22/09/2020	0089_QC215_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW341	14/12/2020	0089_PW341_201214	Normal	EP2013988	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	15/03/2021	0089_PW341_210315	Normal	EP2102752	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	8/06/2021	0089_PW341_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	30/08/2021	0089_PW341_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	10/01/2022	0089_PW341_220110	Normal	EP2200212	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	14/03/2022	0089_PW341_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	7/06/2022	0089_PW341_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW341	5/09/2022	0089_PW341_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste wate Treatment Plant	PW345	13/04/2018	0089_PW345_180413	Normal	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW345	9/01/2020	0089_PW345_200109	Normal	EP2000249	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	31/03/2020	0089_PW345_200331	Normal	EP2003374	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	24/09/2020	0089_PW345_200924	Normal	EP2010271	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	15/12/2020	0089_PW345_201215	Normal	EP2014053	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	16/03/2021	0089_PW345_210316	Normal	EP2102834	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	9/06/2021	0089_PW345_210609	Normal	EP2106517	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	1/09/2021	0089_PW345_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	10/01/2022	0089_PW345_220110	Normal	EP2200215	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	10/01/2022	0089_QC111_220110	Field Duplicate	EP2200215	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	10/01/2022	0089_QC211_220110	Interlab Duplicate	854607	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW345	14/03/2022	0089_PW345_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	7/06/2022	0089_PW345_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW345	5/09/2022	0089_PW345_220905	Normal	EP2211341	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	17/04/2018	0089_PW346_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW346	8/01/2020	0089_PW346_200108	Normal	EP2000186	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	1/04/2020	0089_PW346_200401	Normal	EP2003438	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	15/07/2020	0089_PW346_200715	Normal	EP2007386	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Accommodation Area	PW346	22/09/2020	0089_PW346_200922	Normal	EP2010143	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	15/12/2020	0089_PW346_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	17/03/2021	0089_PW346_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	10/06/2021	0089_PW346_210610	Normal	EP2106580	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	30/08/2021	0089_PW346_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	12/01/2022	0089_PW346_220112	Normal	EP2200289	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	18/03/2022	0089_PW346_220318	Normal	EP2203195	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	8/06/2022	0089_PW346_220608	Normal	EP2206973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW346	6/09/2022	0089_PW346_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste water Treatment Plant	PW350	19/04/2018	0089_PW350_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW350	30/01/2020	0089_PW350_200130	Normal	EP2001003	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	2/04/2020	0089_PW350_200402	Normal	EP2003476	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	21/07/2020	0089_PW350_200721	Normal	EP2007594	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	23/09/2020	0089_PW350_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	16/12/2020	0089_PW350_201216	Normal	EP2014090	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	17/03/2021	0089_PW350_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	8/06/2021	0089_PW350_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	30/08/2021	0089_PW350_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	11/01/2022	0089_PW350_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	14/03/2022	0089_PW350_220314	Normal	EP2202980	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	7/06/2022	0089_PW350_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW350	7/09/2022	0089_PW350_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste water Treatment Plant	PW351	19/04/2018	0089_PW351_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW351	30/01/2020	0089_PW351_200130	Normal	EP2001003	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	2/04/2020	0089_PW351_200402	Normal	EP2003474	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	21/07/2020	0089_PW351_200721	Normal	EP2007594	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	23/09/2020	0089_PW351_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	16/12/2020	0089_PW351_201216	Normal	EP2014090	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	17/03/2021	0089_PW351_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	8/06/2021	0089_PW351_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	30/08/2021	0089_PW351_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	11/01/2022	0089_PW351_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	14/03/2022	0089_PW351_220314	Normal	EP2202980	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	7/06/2022	0089_PW351_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW351	7/09/2022	0089_PW351_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste water Treatment Plant	PW352	19/04/2018	0089_PW352_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW352	30/01/2020	0089_PW352_200130	Normal	EP2001003	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	2/04/2020	0089_PW352_200402	Normal	EP2003476	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	21/07/2020	0089_PW352_200721	Normal	EP2007594	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	23/09/2020	0089_PW352_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	16/12/2020	0089_PW352_201216	Normal	EP2014090	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	17/03/2021	0089_PW352_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	8/06/2021	0089_PW352_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	30/08/2021	0089_PW352_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	11/01/2022	0089_PW352_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	14/03/2022	0089_PW352_220314	Normal	EP2202980	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	7/06/2022	0089_PW352_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW352	7/09/2022	0089_PW352_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	PW356	12/04/2018	0089_PW356_180412	Normal	209345	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW356	12/04/2018	0089_QC6PW_180412	Field Duplicate	209345	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW356	12/04/2018	0089_QC7PW_180412	Interlab Duplicate	594110	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	PW356	9/01/2020	0089_QC202_200109	Interlab Duplicate	696324	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW356	10/01/2020	0089_PW356_200110	Normal	EP2000252	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	10/01/2020	0089_QC102_200110	Field Duplicate	EP2000252	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	30/03/2020	0089_PW356_200330	Normal	EP2003308	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	20/07/2020	0089_PW356_200720	Normal	EP2007544	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	23/09/2020	0089_PW356_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
						Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																			
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	PW356	14/12/2020	0089_PW356_201214	Normal	EP2013973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	16/03/2021	0089_PW356_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	8/06/2021	0089_PW356_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	0.12	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	30/08/2021	0089_PW356_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	10/01/2022	0089_PW356_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	15/03/2022	0089_PW356_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	8/06/2022	0089_PW356_220608	Normal	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW356	5/09/2022	0089_PW356_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	12/04/2018	0089_PW357_180412	Normal	209345	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW357	9/01/2020	0089_QC203_200109	Interlab Duplicate	696324	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW357	10/01/2020	0089_PW357_200110	Normal	EP2000252	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	10/01/2020	0089_QC103_200110	Field Duplicate	EP2000252	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	30/03/2020	0089_PW357_200330	Normal	EP2003308	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	20/07/2020	0089_PW357_200720	Normal	EP2007544	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	23/09/2020	0089_PW357_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	14/12/2020	0089_PW357_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	PW357	16/03/2021	0089_PW357_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	8/06/2021	0089_PW357_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	30/08/2021	0089_PW357_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	10/01/2022	0089_PW357_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	15/03/2022	0089_PW357_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	15/03/2022	0089_QC118_220315	Field Duplicate	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	15/03/2022	0089_QC218_220315	Interlab Duplicate	872903	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW357	8/06/2022	0089_PW357_220608	Normal	EP2208241	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW357	5/09/2022	0089_PW357_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	12/04/2018	0089_PW358_180412	Normal	209345	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW358	10/01/2020	0089_PW358_200110	Normal	EP2000252	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	30/03/2020	0089_PW358_200330	Normal	EP2003308	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	20/07/2020	0089_PW358_200720	Normal	EP2007544	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	23/09/2020	0089_PW358_200923	Normal	EP2010217	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	14/12/2020	0089_PW358_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	16/03/2021	0089_PW358_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	16/03/2021	0089_QC113_210316	Field Duplicate	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition Ground	PW358	16/03/2021	0089_QC213_210316	Interlab Duplicate	781350	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW358	8/06/2021	0089_PW358_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	8/06/2021	0089_QC107_210608	Field Duplicate	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	8/06/2021	0089_QC207_210608	Interlab Duplicate	802464	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW358	30/08/2021	0089_PW358_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	10/01/2022	0089_PW358_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	15/03/2022	0089_PW358_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	8/06/2022	0089_PW358_220608	Normal	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW358	5/09/2022	0089_PW358_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	13/04/2018	0089_PW362_180413	Normal	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW362	8/01/2020	0089_PW362_200108	Normal	EP2000179	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	31/03/2020	0089_PW362_200331	Normal	EP2003364	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	15/07/2020	0089_PW362_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	22/09/2020	0089_PW362_200922	Normal	EP2010151	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	14/12/2020	0089_PW362_201214	Normal	EP2013988	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	15/03/2021	0089_PW362_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	8/06/2021	0089_PW362_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Fire Training Area	PW362	30/08/2021	0089_PW362_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	10/01/2022	0089_PW362_220110	Normal	EP2200212	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	14/03/2022	0089_PW362_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	7/06/2022	0089_PW362_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	7/06/2022	0089_QC110_220607	Field Duplicate	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	7/06/2022	0089_QC210_220607	Interlab Duplicate	896805	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008
	PW362	5/09/2022	0089_PW362_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW362	5/09/2022	0089_QC108_220905	Field Duplicate	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW362	5/09/2022	0089_QC208_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fire Training Area	PW363	13/04/2018	0089_PW363_180413	Normal	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW363	8/01/2020	0089_PW363_200108	Normal	EP2000179	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	31/03/2020	0089_PW363_200331	Normal	EP2003364	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	15/07/2020	0089_PW363_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	22/09/2020	0089_PW363_200922	Normal	EP2010151	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	14/12/2020	0089_PW363_201214	Normal	EP2013988	<0.02	<0.02	<0.05	<0.05	0.25	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	15/03/2021	0089_PW363_210315	Normal	EP2102752	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	8/06/2021	0089_PW363_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	30/08/2021	0089_PW363_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	10/01/2022	0089_PW363_220110	Normal	EP2200212	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	14/03/2022	0089_PW363_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	7/06/2022	0089_PW363_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW363	5/09/2022	0089_PW363_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Fire Training Area	PW364	13/04/2018	0089_PW364_180413	Normal	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW364	9/01/2020	0089_PW364_200109	Normal	EP2000249	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	30/03/2020	0089_PW364_200330	Normal	EP2003333	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	30/03/2020	0089_QC105_200330	Field Duplicate	EP2003333	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	30/03/2020	0089_QC205_200330	Interlab Duplicate	711144	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW364	15/07/2020	0089_PW364_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	22/09/2020	0089_PW364_200922	Normal	EP2010151	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	14/12/2020	0089_PW364_201214	Normal	EP2013985	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	15/03/2021	0089_PW364_210315	Normal	EP2102755	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	8/06/2021	0089_PW364_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	30/08/2021	0089_PW364_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	30/08/2021	0089_QC106_210830	Field Duplicate	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	30/08/2021	0089_QC206_210830	Interlab Duplicate	820919	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW364	10/01/2022	0089_PW364_220110	Normal	EP2200215	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	14/03/2022	0089_PW364_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	14/03/2022	0089_QC101_220314	Field Duplicate	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	14/03/2022	0089_QC201_220314	Interlab Duplicate	872911	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW364	7/06/2022	0089_PW364_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW364	5/09/2022	0089_PW364_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste water Treatment Plant	PW367	17/04/2018	0089_PW367_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW367	8/01/2020	0089_PW367_200108	Normal	EP2000186	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	31/03/2020	0089_PW367_200331	Normal	EP2003374	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	15/07/2020	0089_PW367_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	22/09/2020	0089_PW367_200922	Normal	EP2010143	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	15/12/2020	0089_PW367_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	15/03/2021	0089_PW367_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	9/06/2021	0089_PW367_210609	Normal	EP2106517	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	1/09/2021	0089_PW367_210901	Normal	EP2110155	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	11/01/2022	0089_QC113_220111	Field Duplicate	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	11/01/2022	0089_QC213_220111	Interlab Duplicate	855202	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW367	11/01/2022	0089-PW367_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	14/03/2022	0089_PW367_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	7/06/2022	0089_PW367_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	5/09/2022	0089_PW367_220905	Normal	EP2211341	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	5/09/2022	0089_QC110_220905	Field Duplicate	EP2211341	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW367	5/09/2022	0089_QC210_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW368	17/04/2018	0089_PW368_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW368	8/01/2020	0089_PW368_200108	Normal	EP2000186	<0.02	<0.02	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	1/04/2020	0089_PW368_200401	Normal	EP2003438	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	1/04/2020	0089_QC102_200401	Field Duplicate	EP2003438	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	1/04/2020	0089_QC202_200401	Interlab Duplicate	711709	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW368	20/07/2020	0089_PW368_200720	Normal	EP2007544	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Waste water Treatment Plant	PW368	22/09/2020	0089_PW368_200922	Normal	EP2010143	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	15/12/2020	0089_PW368_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	15/03/2021	0089_PW368_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	15/03/2021	0089_QC102_210315	Field Duplicate	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	15/03/2021	0089_QC202_210315	Interlab Duplicate	781350	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW368	10/06/2021	0089_PW368_210610	Normal	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	1/09/2021	0089_PW368_210901	Normal	EP2110155	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	11/01/2022	0089_PW368_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	18/03/2022	0089_PW368_220318	Normal	EP2203195	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	8/06/2022	0089_PW368_220608	Normal	EP2206973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	5/09/2022	0089_PW368_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	5/09/2022	0089_QC118_220905	Field Duplicate	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW368	5/09/2022	0089_QC218_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW369	17/04/2018	0089_PW369_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW369	9/01/2020	0089_PW369_200109	Normal	EP2000249	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	31/03/2020	0089_PW369_200331	Normal	EP2003374	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	15/07/2020	0089_PW369_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	24/09/2020	0089_PW369_200924	Normal	EP2010271	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	15/12/2020	0089_PW369_201215	Normal	EP2014053	<0.02	<0.02	<0.05	<0.05	<0.05	0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	16/03/2021	0089_PW369_210316	Normal	EP2102834	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	9/06/2021	0089_PW369_210609	Normal	EP2106517	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	1/09/2021	0089_PW369_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	1/09/2021	0089_QC118_210901	Field Duplicate	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	1/09/2021	0089_QC218_210901	Interlab Duplicate	822579	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW369	10/01/2022	0089_PW369_220110	Normal	EP2200215	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	14/03/2022	0089_PW369_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	7/06/2022	0089_PW369_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW369	5/09/2022	0089_PW369_220905	Normal	EP2211341	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil and Careening Bay	PW374	18/04/2018	0089_PW374_180418	Normal	209573	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW374	8/01/2020	0089_PW374_200108	Normal	EP2000186	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	8/01/2020	0089_QC108_200108	Field Duplicate	EP2000186	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	8/01/2020	0089_QC208_200108	Interlab Duplicate	696100	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW374	30/03/2020	0089_PW374_200330	Normal	EP2003313	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	21/07/2020	0089_PW374_200721	Normal	EP2007611	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	21/09/2020	0089_PW374_200921	Normal	EP2010085	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	21/09/2020	0089_QC103_200921	Field Duplicate	EP2010085	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	21/09/2020	0089_QC203_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW374	14/12/2020	0089_PW374_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	15/03/2021	0089_PW374_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	15/03/2021	0089_QC106_210315	Field Duplicate	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	15/03/2021	0089_QC206_210315	Interlab Duplicate	781350	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW374	10/06/2021	0089_PW374_210610	Normal	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	1/09/2021	0089_PW374_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	13/01/2022	0089_PW374_220113	Normal	EP2200343	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	16/03/2022	0089_PW374_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	9/06/2022	0089_PW374_220609	Normal	EP2207029	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW374	6/09/2022	0089_PW374_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil and Careening Bay	PW375	18/04/2018	0089_PW375_180418	Normal	209573	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW375	8/01/2020	0089_PW375_200108	Normal	EP2000186	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	30/03/2020	0089_PW375_200330	Normal	EP2003313	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	21/07/2020	0089_PW375_200721	Normal	EP2007611	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	21/09/2020	0089_PW375_200921	Normal	EP2010085	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	14/12/2020	0089_PW375_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	14/12/2020	0089_QC109_201214	Field Duplicate	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	14/12/2020	0089_QC209_201114	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW375	15/03/2021	0089_PW375_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	10/06/2021	0089_PW375_210610	Normal	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW375	10/06/2021	0089_QC118_210610	Field Duplicate	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	10/06/2021	0089_QC218_210610	Interlab Duplicate	802734	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW375	1/09/2021	0089_PW375_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	13/01/2022	0089_PW375_220113	Normal	EP2200343	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	16/03/2022	0089_PW375_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	9/06/2022	0089_PW375_220609	Normal	EP2207029	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW375	6/09/2022	0089_PW375_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge Spoil and Careening Bay	PW378	17/04/2018	0089_PW378_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW378	8/01/2020	0089_PW378_200108	Normal	EP2000186	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	30/03/2020	0089_PW378_200330	Normal	EP2003313	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	21/07/2020	0089_PW378_200721	Normal	EP2007611	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	21/09/2020	0089_PW378_200921	Normal	EP2010085	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	14/12/2020	0089_PW378_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	15/03/2021	0089_PW378_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	10/06/2021	0089_PW378_210610	Normal	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	1/09/2021	0089_PW378_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	13/01/2022	0089_PW378_220113	Normal	EP2200343	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	16/03/2022	0089_PW378_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	9/06/2022	0089_PW378_220609	Normal	EP2207029	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW378	6/09/2022	0089_PW378_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste water Treatment Plant	PW380	19/04/2018	0089_PW380_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW380	30/01/2020	0089_PW380_200130	Normal	EP2001003	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	2/04/2020	0089_PW380_200402	Normal	EP2003476	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	21/07/2020	0089_PW380_200721	Normal	EP2007594	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	23/09/2020	0089_PW380_200923	Normal	EP2010217	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	16/12/2020	0089_PW380_201216	Normal	EP2014090	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	17/03/2021	0089_PW380_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	8/06/2021	0089_PW380_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	30/08/2021	0089_PW380_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	11/01/2022	0089_PW380_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	14/03/2022	0089_PW380_220314	Normal	EP2202980	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	7/06/2022	0089_PW380_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW380	7/09/2022	0089_PW380_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste water Treatment Plant	PW381	19/04/2018	0089_PW381_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW381	30/01/2020	0089_PW381_200130	Normal	EP2001003	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	2/04/2020	0089_PW381_200402	Normal	EP2003474	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	21/07/2020	0089_PW381_200721	Normal	EP2007594	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	23/09/2020	0089_PW381_200923	Normal	EP2010217	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	16/12/2020	0089_PW381_201216	Normal	EP2014104	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	17/03/2021	0089_PW381_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	8/06/2021	0089_PW381_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	30/08/2021	0089_PW381_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	11/01/2022	0089_PW381_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	14/03/2022	0089_PW381_220314	Normal	EP2202980	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	7/06/2022	0089_PW381_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW381	7/09/2022	0089_PW381_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste water Treatment Plant	PW401	19/04/2018	0089_PW379_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	PW401	30/01/2020	0089_PW401_200130	Normal	EP2001003	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	2/04/2020	0089_PW401_200402	Normal	EP2003474	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	21/07/2020	0089_PW401_200721	Normal	EP2007594	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	23/09/2020	0089_PW401_200923	Normal	EP2010220	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	16/12/2020	0089_PW401_201216	Normal	EP2014090	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	17/03/2021	0089_PW401_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	8/06/2021	0089_PW401_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	30/08/2021	0089_PW401_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	11/01/2022	0089_PW401_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	14/03/2022	0089_PW401_220314	Normal	EP2202980	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW401	7/06/2022	0089_PW401_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW401	7/09/2022	0089_PW401_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW405	14/01/2020	0089_PW405_200114	Normal	EP2000432	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	1/04/2020	0089_PW405_200401	Normal	EP2003417	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	22/07/2020	0089_PW405_200722	Normal	EP2007648	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	21/09/2020	0089_PW405_200921	Normal	EP2010085	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	21/09/2020	0089_QC110_200921	Field Duplicate	EP2010085	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	21/09/2020	0089_QC210_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW405	15/12/2020	0089_PW405_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	15/03/2021	0089_PW405_210315	Normal	EP2102752	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	10/06/2021	0089_PW405_210610	Normal	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	10/06/2021	0089_QC115_210610	Field Duplicate	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	10/06/2021	0089_QC215_210610	Interlab Duplicate	802734	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW405	31/08/2021	0089_PW405_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	31/08/2021	0089_QC117_210831	Field Duplicate	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	31/08/2021	0089_QC217_210831	Interlab Duplicate	821197	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW405	14/01/2022	0089_PW405_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	16/03/2022	0089_PW405_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	7/06/2022	0089_PW405_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW405	7/09/2022	0089_PW405_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW407	14/01/2020	0089_PW407_200114	Normal	EP2000432	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	1/04/2020	0089_PW407_200401	Normal	EP2003417	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	22/07/2020	0089_PW407_200722	Normal	EP2007648	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	21/09/2020	0089_PW407_200921	Normal	EP2010085	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	15/12/2020	0089_PW407_201215	Normal	EP2014053	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	15/03/2021	0089_PW407_210315	Normal	EP2102752	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	10/06/2021	0089_PW407_210610	Normal	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	31/08/2021	0089_PW407_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	14/01/2022	0089_PW407_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	16/03/2022	0089_PW407_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	7/06/2022	0089_PW407_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW407	7/09/2022	0089_PW407_220907	Normal	EP2211498	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW409	14/01/2020	0089_PW409_200114	Normal	EP2000432	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	1/04/2020	0089_PW409_200401	Normal	EP2003417	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	21/07/2020	0089_PW409_200721	Normal	EP2007611	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	22/09/2020	0089_PW409_200922	Normal	EP2010143	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	22/09/2020	0089_QC113_200922	Field Duplicate	EP2010143	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	22/09/2020	0089_QC213_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	PW409	15/12/2020	0089_PW409_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	17/03/2021	0089_PW409_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	10/06/2021	0089_PW409_210610	Normal	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	31/08/2021	0089_PW409_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	14/01/2022	0089_PW409_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	16/03/2022	0089_PW409_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	7/06/2022	0089_PW409_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW409	6/09/2022	0089_PW409_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW411	14/01/2020	0089_PW411_200114	Normal	EP2000432	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	1/04/2020	0089_PW411_200401	Normal	EP2003417	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	21/07/2020	0089_PW411_200721	Normal	EP2007611	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	22/09/2020	0089_PW411_200922	Normal	EP2010143	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	15/12/2020	0089_PW411_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	18/03/2021	0089_PW411_210318	Normal	EP2102956	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	9/06/2021	0089_PW411_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	1/09/2021	0089_PW411_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	14/01/2022	0089_PW411_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	16/03/2022	0089_PW411_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW411	7/06/2022	0089_PW411_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 2 - Pore water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
						Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.005
PFAS NEMP 2020 Drinking Water																			
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	PW411	6/09/2022	0089_PW411_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW413	14/01/2020	0089_PW413_200114	Normal	EP2000432	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	1/04/2020	0089_PW413_200401	Normal	EP2003417	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	21/07/2020	0089_PW413_200721	Normal	EP2007611	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	22/09/2020	0089_PW413_200922	Normal	EP2010143	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	15/12/2020	0089_PW413_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	18/03/2021	0089_PW413_210318	Normal	EP2102941	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	9/06/2021	0089_PW413_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	1/09/2021	0089_PW413_210901	Normal	EP2110155	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	14/01/2022	0089_PW413_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	16/03/2022	0089_PW413_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	7/06/2022	0089_PW413_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW413	6/09/2022	0089_PW413_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	PW415	14/01/2020	0089_PW415_200114	Normal	EP2000432	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	1/04/2020	0089_PW415_200401	Normal	EP2003417	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	21/07/2020	0089_PW415_200721	Normal	EP2007611	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	22/09/2020	0089_PW415_200922	Normal	EP2010145	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	15/12/2020	0089_PW415_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	18/03/2021	0089_PW415_210318	Normal	EP2102941	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	9/06/2021	0089_PW415_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	1/09/2021	0089_PW415_210901	Normal	EP2110155	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	14/01/2022	0089_PW415_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	16/03/2022	0089_PW415_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	7/06/2022	0089_PW415_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	PW415	6/09/2022	0089_PW415_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

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Table 2 - Pore water Analytical Results

						PFAS			Inorganics										
						Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water						*0.07*													
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water						**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Waste water Treatment Plant	PW304	17/04/2018	0089_PW304_180417	Normal	209522														
	PW304	8/01/2020	0089_PW304_200108	Normal	EP2000186	*0.09*	0.09	0.09	302	302	371	397	11,700	3.37	1,670	289	874	382	6,910
	PW304	1/04/2020	0089_PW304_200401	Normal	EP2003438	<0.01	<0.01	<0.01	434	434	113	120	3,270	2.68	603	106	273	109	2,050
	PW304	1/04/2020	0089_QC101_200401	Field Duplicate	EP2003438	<0.01	<0.01	<0.01	431	431	112	124	3,210	5.28	595	111	284	112	2,120
	PW304	1/04/2020	0089_QC201_200401	Interlab Duplicate	711709	0.01	<0.05	<0.1	470	470			3,400						
	PW304	20/07/2020	0089_PW304_200720	Normal	EP2007544	<0.01	<0.01	<0.01	443	443	234	255	7,370	4.33	819	314	587	205	4,270
	PW304	22/09/2020	0089_PW304_200922	Normal	EP2010143	<0.01	<0.01	<0.01	347	347	412	388	13,100	2.96	1,720	351	858	368	6,690
	PW304	15/12/2020	0089_PW304_201215	Normal	EP2014048	0.02	0.02	0.02	209	209	453	469	14,400	1.72	2,060	391	1,090	451	8,010
	PW304	15/03/2021	0089_PW304_210315	Normal	EP2102755	0.03	0.03	0.03	352	352	510	544	16,200	3.26	2,190	424	1,220	496	9,420
	PW304	10/06/2021	0089_PW304_210610	Normal	EP2106582	<0.01	<0.01	<0.01	657	657	344	321	10,700	3.34	1,380	268	916	357	5,140
	PW304	1/09/2021	0089_PW304_210901	Normal	EP2110155	0.02	0.02	0.02	193	193	524	567	16,900	3.87	2,110	437	1,270	521	9,820
	PW304	11/01/2022	0089_PW304_220111	Normal	EP2200240	*0.09*	0.09	0.09	244	244	626	648	20,000	1.73	2,720	432	1,420	527	11,400
	PW304	18/03/2022	0089_PW304_220318	Normal	EP2203195	0.04	0.04	0.04	245	245	406	438	12,900	3.80	1,770	339	1,000	463	7,510
	PW304	8/06/2022	0089_PW304_220608	Normal	EP2206973	0.02	0.02	0.02	285	285	548	570	17,300	1.99	2,610	452	1,360	542	9,700
	PW304	5/09/2022	0089_PW304_220905	Normal	EP2211344	0.04	0.04	0.04	294	294	497	511	15,900	1.36	2,060	414	1,160	488	8,790
Helicopter Support Facility	PW306	18/04/2018	0089_PW306_180418	Normal	209573														
	PW306	10/01/2020	0089_PW306_200110	Normal	EP2000293	<0.01	<0.01	<0.01	124	124	589	598	18,800	0.74	2,720	416	1,310	508	10,500
	PW306	31/03/2020	0089_PW306_200331	Normal	EP2003366	<0.01	<0.01	<0.01	162	162	596	756	18,900	11.9	2,850	532	1,750	796	13,000
	PW306	22/07/2020	0089_PW306_200722	Normal	EP2007648	<0.01	<0.01	<0.01	136	136	587	644	18,700	4.60	2,740	434	1,380	501	11,400
	PW306	23/09/2020	0089_PW306_200923	Normal	EP2010220	<0.01	<0.01	<0.01	120	120	618	678	19,700	4.60	2,880	489	1,550	656	11,700
	PW306	15/12/2020	0089_PW306_201215	Normal	EP2014048	<0.01	<0.01	<0.01	184	184	631	677	20,100	3.51	2,910	517	1,520	677	11,700
	PW306	17/03/2021	0089_PW306_210317	Normal	EP2102892	<0.01	<0.01	<0.01	201	201	649	609	20,600	3.13	3,050	465	1,340	576	10,600
	PW306	9/06/2021	0089_PW306_210609	Normal	EP2106519	<0.01	<0.01	<0.01	115	115	583	673	18,700	7.17	2,550	472	1,510	634	11,700
	PW306	31/08/2021	0089_PW306_210831	Normal	EP2110072	<0.01	<0.01	<0.01	119	119	554	627	17,700	6.20	2,510	452	1,410	563	10,900
	PW306	13/01/2022	0089_PW306_220113	Normal	EP2200338	<0.01	<0.01	<0.01	137	137	612	717	19,700	7.96	2,550	470	1,580	614	12,600
	PW306	16/03/2022	0089_PW306_220316	Normal	EP2203058	<0.01	<0.01	<0.01	116	116	605	664	19,300	4.69	2,800	456	1,520	644	11,500
	PW306	7/06/2022	0089_PW306_220607	Normal	EP2206887	<0.01	<0.01	<0.01	629	629	616	602	19,300	1.09	2,810	541	1,410	607	10,200
	PW306	6/09/2022	0089_PW306_220906	Normal	EP2211401	<0.01	<0.01	<0.01	117	117	571	618	18,200	4.02	2,640	434	1,390	494	10,800
Helicopter Support Facility	PW307	30/04/2018	0089_PW307_180430	Normal	209959														
	PW307	10/01/2020	0089_PW307_200110	Normal	EP2000293	<0.01	<0.01	<0.01	113	113	584	606	18,600	1.91	2,730	427	1,350	509	10,600
	PW307	31/03/2020	0089_PW307_200331	Normal	EP2003366	<0.01	<0.01	<0.01	123	123	576	692	18,300	9.14	2,780	497	1,600	722	11,900
	PW307	22/07/2020	0089_PW307_200722	Normal	EP2007648	<0.01	<0.01	<0.01	121	121	587	649	18,700	5.02	2,740	433	1,390	501	11,500
	PW307	23/09/2020	0089_PW307_200923	Normal	EP2010220	<0.01	<0.01	<0.01	122	122	632	694	20,200	4.64	2,880	490	1,580	676	12,000
	PW307	15/12/2020	0089_PW307_201215	Normal	EP2014053	<0.01	<0.01	<0.01	123	123	627	722	19,900	7.07	3,030	525	1,630	710	12,500
	PW307	17/03/2021	0089_PW307_210317	Normal	EP2102892	<0.01	<0.01	<0.01	118	118	646	595	20,600	4.17	3,030	424	1,300	557	10,400
	PW307	9/06/2021	0089_PW307_210609	Normal	EP2106519	<0.01	<0.01	<0.01	114	114	578	689	18,500	8.80	2,580	482	1,540	651	12,000
	PW307	31/08/2021	0089_PW307_210831	Normal	EP2110065	<0.01	<0.01	<0.01	117	117	552	590	17,700	3.36	2,420	406	1,320	526	10,300
	PW307	13/01/2022	0089_PW307_220113	Normal	EP2200338	<0.01	<0.01	<0.01	110	110	616	685	19,900	5.24	2,540	447	1,520	596	12,000
	PW307	16/03/2022	0089_PW307_220316	Normal	EP2203058	<0.01	<0.01	<0.01	132	132	590	676	18,800	6.80	2,740	475	1,540	654	11,700
	PW307	7/06/2022	0089_PW307_220607	Normal	EP2206887	<0.01	<0.01	<0.01	137	137	538	610	17,100	6.26	2,540	442	1,420	555	10,500
	PW307	6/09/2022	0089_PW307_220906	Normal	EP2211401	<0.01	<0.01	<0.01	122	122	559	630	17,800	5.99	2,610	437	1,420	506	11,000
Helicopter Support Facility	PW308	30/04/2018	0089_PW308_180430	Normal	209959														
	PW308	10/01/2020	0089_PW308_200110	Normal	EP2000293	<0.01	<0.01	<0.01	118	118	587	593	18,700	0.51	2,730	413	1,300	500	10,400
	PW308	1/04/2020	0089_PW308_200401	Normal	EP2003417	<0.01	<0.01	<0.01	121	121	640	731	20,500	6.60	2,870	507	1,680	758	12,600
	PW308	22/07/2020	0089_PW308_200722	Normal	EP2007648	<0.01	<0.01	<0.01	146	146	590	645	18,800	4.42	2,750	439	1,390	505	11,400
	PW308	23/09/2020	0089_PW308_200923	Normal	EP2010217	<0.01	<0.01	<0.01	125	125	607	694	19,300	6.68	2,880	492	1,580	674	12,000
	PW308	15/12/2020	0089_PW308_201215	Normal	EP2014053	<0.01	<0.01	<0.01	117	117	614	703	19,400	6.83	3,070	507	1,580	684	12,200
	PW308	17/03/2021	0089_PW308_210317	Normal	EP2102892	0.01	0.01	0.01	156	156	642	590	20,400	4.19	3,040	420	1,300	556	10,300
	PW308	9/06/2021	0089_PW308_210609	Normal	EP2106519	<0.01	<0.01	<0.01	111	111	576	662	18,400	6.98	2,620	468	1,490	625	11,500
	PW308	31/08/2021	0089_PW308_210831	Normal	EP2110072	<0.01	<0.01	<0.01	127	127	563	685	18,000	9.77	2,520	486	1,540	625	11,900
	PW308	13/01/2022	0089_PW308_220113	Normal	EP2200338	<0.01	<0.01	<0.01	113	113	616	678	19,900	4.81	2,510	443	1,500	582	11,900
	PW308	16/03/2022	0089_PW308_220316	Normal	EP2203058	<0.01	<0.01	<0.01	136	136	600	651	19,100	4.09	2,820	447	1,480	619	11,300
	PW308	7/06/2022	0089_PW308_220607	Normal	EP2206887	0.03	0.03	0.03	132	132	520	606	16,400	7.69	2,610	439	1,430	557	10,400
	PW308	6/09/2022	0089_PW308_220906	Normal	EP2211401	<0.01	<0.01	<0.01	114	114	593	601	19,000	0.67	2,620	417	1,350	477	10,500
	PW314	18/04/2018	0089_PW314_180418	Normal	209573														
	PW314	10/01/2020	0089_PW314_200110	Normal	EP2000293	<0.01	<0.01	<0.01	126	126	586	582	18,700	0.30	2,680	412	1,280	496	10,200
	PW314	31/03/2020	0089_PW314_200331	Normal	EP2003366	<0.01	<0.01	<0.01	165	165	591	710	18,800	9.16	2,760	531	1,630	740	12,200

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Table 2 - Pore water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Helicopter Support Facility	PW314	22/07/2020	0089_PW314_200722	Normal	EP2007648	<0.01	<0.01	<0.01	134	134	586	667	18,700	6.45	2,680	454	1,430	515	11,800
	PW314	23/09/2020	0089_PW314_200923	Normal	EP2010220	<0.01	<0.01	<0.01	179	179	631	682	20,100	3.88	2,910	486	1,550	663	11,800
	PW314	15/12/2020	0089_PW314_201215	Normal	EP2014048	<0.01	<0.01	<0.01	341	341	638	721	20,300	6.14	2,800	578	1,630	737	12,400
	PW314	17/03/2021	0089_PW314_210317	Normal	EP2102892	<0.01	<0.01	<0.01	131	131	657	607	20,900	3.96	3,110	433	1,330	577	10,600
	PW314	9/06/2021	0089_PW314_210609	Normal	EP2106519	<0.01	<0.01	<0.01	109	109	583	657	18,700	5.90	2,580	463	1,480	619	11,400
	PW314	31/08/2021	0089_PW314_210831	Normal	EP2110065	<0.01	<0.01	<0.01	117	117	561	586	18,000	2.14	2,450	402	1,320	521	10,200
	PW314	13/01/2022	0089_PW314_220113	Normal	EP2200338	<0.01	<0.01	<0.01	116	116	623	674	20,100	3.92	2,580	444	1,500	585	11,800
	PW314	16/03/2022	0089_PW314_220316	Normal	EP2203058	<0.01	<0.01	<0.01	135	135	604	700	19,300	7.37	2,710	489	1,600	674	12,100
	PW314	7/06/2022	0089_PW314_220607	Normal	EP2206887	<0.01	<0.01	<0.01	158	158	599	594	19,000	0.40	2,890	452	1,380	576	10,200
	PW314	6/09/2022	0089_PW314_220906	Normal	EP2211401	<0.01	<0.01	<0.01	118	118	587	606	18,800	1.64	2,600	421	1,360	485	10,600
Helicopter Support Facility	PW315	30/04/2018	0089_PW315_180430	Normal	209959														
	PW315	10/01/2020	0089_PW315_200110	Normal	EP2000293	<0.01	<0.01	<0.01	114	114	608	611	19,300	0.24	2,940	424	1,350	513	10,700
	PW315	1/04/2020	0089_PW315_200401	Normal	EP2003417	<0.01	<0.01	<0.01	128	128	642	753	20,600	7.94	2,810	523	1,720	775	13,000
	PW315	22/07/2020	0089_PW315_200722	Normal	EP2007648	<0.01	<0.01	<0.01	160	160	584	646	18,600	5.08	2,690	452	1,390	530	11,400
	PW315	23/09/2020	0089_PW315_200923	Normal	EP2010217	<0.01	<0.01	<0.01	122	122	616	705	19,600	6.73	2,920	502	1,600	688	12,200
	PW315	15/12/2020	0089_PW315_201215	Normal	EP2014048	<0.01	<0.01	<0.01	126	126	644	706	20,600	4.55	2,910	516	1,590	718	12,200
	PW315	17/03/2021	0089_PW315_210317	Normal	EP2102892	<0.01	<0.01	<0.01	121	121	633	578	20,200	4.55	2,940	412	1,270	542	10,100
	PW315	9/06/2021	0089_PW315_210609	Normal	EP2106519	<0.01	<0.01	<0.01	114	114	577	652	18,500	6.08	2,560	463	1,480	616	11,300
	PW315	31/08/2021	0089_PW315_210831	Normal	EP2110072	0.01	0.01	0.01	120	120	552	662	17,700	8.99	2,440	471	1,490	600	11,500
	PW315	31/08/2021	0089_QC116_210831	Field Duplicate	EP2110072	0.01	0.01	0.01	120	120	558	680	17,900	9.87	2,440	490	1,540	622	11,800
	PW315	31/08/2021	0089_QC216_210831	Interlab Duplicate	821197	<0.01	<0.05	<0.1											
	PW315	12/01/2022	0089_QC219_220113	Interlab Duplicate	855202	<0.01	<0.05	<0.1											
	PW315	13/01/2022	0089_PW315_220113	Normal	EP2200338	<0.01	<0.01	<0.01	113	113	616	640	19,900	1.86	2,540	419	1,430	550	11,200
	PW315	13/01/2022	0089_QC119_220113	Field Duplicate	EP2200338	<0.01	<0.01	<0.01											
	PW315	16/03/2022	0089_PW315_220316	Normal	EP2203058	<0.01	<0.01	<0.01	138	138	602	682	19,100	6.29	2,890	479	1,560	664	11,800
	PW315	7/06/2022	0089_PW315_220607	Normal	EP2206887	<0.01	<0.01	<0.01	200	200	550	641	17,500	7.64	2,520	488	1,500	582	11,000
	PW315	7/06/2022	0089_QC104_220607	Field Duplicate	EP2206887	<0.01	<0.01	<0.01											
	PW315	7/06/2022	0089_QC204_220607	Interlab Duplicate	896805	<0.002	<0.001	<0.001											
	PW315	6/09/2022	0089_PW315_220906	Normal	EP2211401	<0.01	<0.01	<0.01	118	118	576	624	18,400	4.02	2,600	434	1,400	499	10,900
Helicopter Support Facility	PW316	30/04/2018	0089_PW316_180430	Normal	209959														
	PW316	10/01/2020	0089_PW316_200110	Normal	EP2000293	<0.01	<0.01	<0.01	126	126	607	599	19,300	0.62	2,870	418	1,320	509	10,500
	PW316	1/04/2020	0089_PW316_200401	Normal	EP2003417	<0.01	<0.01	<0.01	116	116	595	676	19,000	6.39	2,730	490	1,540	634	11,700
	PW316	22/07/2020	0089_PW316_200722	Normal	EP2007648	<0.01	<0.01	<0.01	132	132	585	661	18,600	6.08	2,780	443	1,420	513	11,700
	PW316	23/09/2020	0089_PW316_200923	Normal	EP2010217	<0.01	<0.01	<0.01	132	132	618	710	19,700	6.93	2,880	505	1,610	692	12,300
	PW316	15/12/2020	0089_PW316_201215	Normal	EP2014053	*0.10*	0.10	0.10	144	144	636	723	20,200	6.37	3,050	527	1,630	725	12,500
	PW316	17/03/2021	0089_PW316_210317	Normal	EP2102892	<0.01	<0.01	<0.01	131	131	687	636	21,900	3.86	3,220	451	1,400	615	11,100
	PW316	9/06/2021	0089_PW316_210609	Normal	EP2106519	<0.01	<0.01	<0.01	118	118	575	673	18,400	7.84	2,580	474	1,510	631	11,700
	PW316	31/08/2021	0089_PW316_210831	Normal	EP2110065	<0.01	<0.01	<0.01	142	142	550	587	17,600	3.27	2,430	410	1,330	529	10,200
	PW316	13/01/2022	0089_PW316_220113	Normal	EP2200338	<0.01	<0.01	<0.01	115	115	610	668	19,700	4.54	2,500	436	1,490	578	11,700
	PW316	16/03/2022	0089_PW316_220316	Normal	EP2203058	<0.01	<0.01	<0.01	120	120	591	619	18,800	2.35	2,780	430	1,420	596	10,700
	PW316	7/06/2022	0089_PW316_220607	Normal	EP2206887	<0.01	<0.01	<0.01	139	139	534	628	17,000	8.09	2,490	458	1,470	571	10,800
	PW316	6/09/2022	0089_PW316_220906	Normal	EP2211401	<0.01	<0.01	<0.01	119	119	587	618	18,800	2.51	2,620	431	1,380	496	10,800
Demolition Ground	PW329	12/04/2018	0089_PW329_180412	Normal	209345														
	PW329	10/01/2020	0089_PW329_200110	Normal	EP2000252	<0.01	<0.01	<0.01	223	223	837	931	27,000	5.35	3,400	664	2,100	985	16,100
	PW329	30/03/2020	0089_PW329_200330	Normal	EP2003308	<0.01	<0.01	<0.01	462	462	661	802	20,800	9.68	3,120	725	1,870	817	13,600
	PW329	20/07/2020	0089_PW329_200720	Normal	EP2007544	<0.01	<0.01	<0.01	122	122	565	690	18,000	9.94	2,640	477	1,510	607	12,100
	PW329	23/09/2020	0089_PW329_200923	Normal	EP2010217	<0.01	<0.01	<0.01	200	200	626	676	19,900	3.85	2,910	484	1,530	666	11,700
	PW329	14/12/2020	0089_PW329_201214	Normal	EP2013973	<0.01	<0.01	<0.01	134	134	610	689	19,400	6.10	2,870	472	1,550	616	12,000
	PW329	14/12/2020	0089_QC102_201214	Field Duplicate	EP2013973	<0.01	<0.01	<0.01	133	133	603	676	19,200	5.68	2,840	461	1,510	608	11,800
	PW329	14/12/2020	0089_QC202_201114	Interlab Duplicate	765054	<0.01	<0.05	<0.1	170	170			26,000						
	PW329	16/03/2021	0089_PW329_210316	Normal	EP2102836	<0.01	<0.01	<0.01	186	186	658	725	21,000	4.79	3,000	517	1,620	689	12,600
	PW329	16/03/2021	0089_QC110_210316	Field Duplicate	EP2102836	<0.01	<0.01	<0.01	148	148	661	707	21,100	3.34	3,020	511	1,570	666	12,300
	PW329	16/03/2021	0089_QC210_210316	Interlab Duplicate	781350	<0.01	<0.05	<0.1	190				19,000						
	PW329	8/06/2021	0089_PW329_210608	Normal	EP2106465	<0.01	<0.01	<0.01	146	146	546	634	17,300	7.45	2,640	466	1,420	595	11,000
	PW329	8/06/2021	0089_QC103_210608	Field Duplicate	EP2106465	<0.01	<0.01	<0.01	140	140	553	635	17,500	6.93	2,700	473	1,430	593	11,000
	PW329	8/06/2021	0089_QC203_210608	Interlab Duplicate	802464	<0.01	<0.05	<0.1	290				20,000						
	PW329	30/08/2021	0089_PW329_210830	Normal	EP2110017	<0.01	<0.01	<0.01	147	147	556	601	17,800	3.89	2,460	450	1,350	600	10,400

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Table 2 - Pore water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW329	10/01/2022	0089_PW329_220110	Normal	EP2200218	<0.01	<0.01	<0.01	178	178	708	719	22,800	0.78	2,940	467	1,530	513	12,800
	PW329	10/01/2022	0089_QC108_220110	Field Duplicate	EP2200218	<0.01	<0.01	<0.01											
	PW329	10/01/2022	0089_QC208_220110	Interlab Duplicate	854607	<0.01	<0.05	<0.1											
	PW329	15/03/2022	0089_PW329_220315	Normal	EP2203019	<0.01	<0.01	<0.01	151	151	604	692	19,300	6.82	2,720	494	1,570	652	12,000
	PW329	15/03/2022	0089_QC116_220315	Field Duplicate	EP2203019	<0.01	<0.01	<0.01											
	PW329	15/03/2022	0089_QC216_220315	Interlab Duplicate	872903	<0.01	<0.05	<0.1											
	PW329	8/06/2022	0089_PW329_220608	Normal	EP2206970	<0.01	<0.01	<0.01	245	245	568	651	18,200	6.83	2,370	509	1,540	624	11,100
	PW329	5/09/2022	0089_PW329_220905	Normal	EP2211347	<0.01	<0.01	<0.01	175	175	599	630	19,200	2.58	2,570	442	1,420	507	11,000
Demolition Ground	PW330	12/04/2018	0089_PW330_180412	Normal	209345														
	PW330	10/01/2020	0089_PW330_200110	Normal	EP2000252	<0.01	<0.01	<0.01	322	322	890	945	28,800	2.98	3,430	696	2,140	979	16,300
	PW330	30/03/2020	0089_PW330_200330	Normal	EP2003308	<0.01	<0.01	<0.01	257	257	629	756	19,900	9.17	3,010	623	1,760	747	12,900
	PW330	20/07/2020	0089_PW330_200720	Normal	EP2007544	<0.01	<0.01	<0.01	122	122	586	672	18,700	6.88	2,690	465	1,470	592	11,800
	PW330	22/09/2020	0089_PW330_200922	Normal	EP2010151	<0.01	<0.01	<0.01	160	160	617	687	19,700	5.40	2,790	528	1,540	652	11,900
	PW330	14/12/2020	0089_PW330_201214	Normal	EP2013989	<0.01	<0.01	<0.01	128	128	626	731	19,900	7.77	2,980	516	1,640	715	12,700
	PW330	16/03/2021	0089_PW330_210316	Normal	EP2102836	<0.01	<0.01	<0.01	134	134	661	713	21,200	3.76	2,920	511	1,590	685	12,400
	PW330	8/06/2021	0089_PW330_210608	Normal	EP2106465	<0.01	<0.01	<0.01	138	138	570	628	18,200	4.92	2,570	465	1,410	594	10,900
	PW330	30/08/2021	0089_PW330_210830	Normal	EP2110017	<0.01	<0.01	<0.01	148	148	553	595	17,600	3.64	2,570	443	1,330	591	10,300
	PW330	10/01/2022	0089_PW330_220110	Normal	EP2200218	<0.01	<0.01	<0.01	144	144	680	763	21,900	5.78	2,850	490	1,620	550	13,600
	PW330	15/03/2022	0089_PW330_220315	Normal	EP2203019	<0.01	<0.01	<0.01	131	131	618	731	19,800	8.40	2,730	512	1,650	686	12,700
	PW330	8/06/2022	0089_PW330_220608	Normal	EP2206970	<0.01	<0.01	<0.01	418	418	586	671	18,600	6.82	2,520	586	1,580	631	11,400
	PW330	8/06/2022	0089_QC117_220608	Field Duplicate	EP2206970	<0.01	<0.01	<0.01											
	PW330	8/06/2022	0089_QC217_220608	Interlab Duplicate	896805	<0.002	<0.001	<0.001											
	PW330	5/09/2022	0089_PW330_220905	Normal	EP2211347	<0.01	<0.01	<0.01	154	154	594	642	19,000	3.88	2,640	449	1,450	513	11,200
Demolition Ground	PW331	12/04/2018	0089_PW331_180412	Normal	209345														
	PW331	10/01/2020	0089_PW331_200110	Normal	EP2000252	<0.01	<0.01	<0.01	234	234	673	789	21,400	7.91	3,120	576	1,800	800	13,600
	PW331	30/03/2020	0089_PW331_200330	Normal	EP2003308	<0.01	<0.01	<0.01	241	241	656	764	20,900	7.63	2,940	613	1,800	770	13,000
	PW331	20/07/2020	0089_PW331_200720	Normal	EP2007544	<0.01	<0.01	<0.01	130	130	568	655	18,200	7.11	2,520	454	1,430	582	11,500
	PW331	23/09/2020	0089_PW331_200923	Normal	EP2010220	<0.01	<0.01	<0.01	210	210	639	668	20,400	2.15	2,870	489	1,530	664	11,500
	PW331	14/12/2020	0089_PW331_201214	Normal	EP2013973	<0.01	<0.01	<0.01	142	142	606	712	19,300	7.99	2,840	509	1,620	703	12,300
	PW331	14/12/2020	0089_QC104_201214	Field Duplicate	EP2013973	<0.01	<0.01	<0.01	141	141	606	711	19,300	7.98	2,820	512	1,610	703	12,300
	PW331	14/12/2020	0089_QC204_201114	Interlab Duplicate	765054	<0.01	<0.05	<0.1	180	180			49,000						
	PW331	16/03/2021	0089_PW331_210316	Normal	EP2102836	<0.01	<0.01	<0.01	172	172	646	736	20,600	6.46	2,970	538	1,630	700	12,800
	PW331	8/06/2021	0089_PW331_210608	Normal	EP2106465	<0.01	<0.01	<0.01	110	110	591	622	18,900	2.59	2,660	446	1,400	584	10,800
	PW331	30/08/2021	0089_PW331_210830	Normal	EP2110017	<0.01	<0.01	<0.01	125	125	545	605	17,400	5.26	2,470	443	1,350	599	10,500
	PW331	10/01/2022	0089_PW331_220110	Normal	EP2200218	<0.01	<0.01	<0.01	135	135	672	720	21,700	3.46	2,750	469	1,540	524	12,800
	PW331	15/03/2022	0089_PW331_220315	Normal	EP2203019	0.01	0.01	0.01	172	172	619	687	19,800	5.19	2,750	491	1,560	648	11,900
	PW331	15/03/2022	0089_QC114_220315	Field Duplicate	EP2203019	0.01	0.01	0.01	172	172	591	702	18,800	8.59	2,750	494	1,580	656	12,200
	PW331	15/03/2022	0089_QC214_220315	Interlab Duplicate	872903	<0.01	<0.05	<0.1											
	PW331	8/06/2022	0089_PW331_220608	Normal	EP2206970	<0.01	<0.01	<0.01	247	247	564	684	17,600	9.63	3,020	529	1,610	654	11,700
	PW331	8/06/2022	0089_QC118_220608	Field Duplicate	EP2206970	<0.01	<0.01	<0.01											
	PW331	8/06/2022	0089_QC218_220608	Interlab Duplicate	896805	0.006	0.006	0.006											
	PW331	5/09/2022	0089_PW331_220905	Normal	EP2211347	<0.01	<0.01	<0.01	203	203	564	631	18,000	5.65	2,490	451	1,410	551	11,000
	PW331	5/09/2022	0089_QC106_220905	Field Duplicate	EP2211347	<0.01	<0.01	<0.01	209	209	684	621	22,300	4.86	2,450	441	1,390	573	10,800
	PW331	5/09/2022	0089_QC206_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.1											
Fire Training Area	PW335	13/04/2018	0089_PW335_180413	Normal	209417														
	PW335	13/04/2018	0089_QC1PW_180413	Field Duplicate	209417														
	PW335	13/04/2018	0089_QC2PW_180413	Interlab Duplicate	594110	0.016	0.023	0.023											
	PW335	13/04/2018	0089_QC2PW_180413	Interlab Duplicate	594110														
	PW335	9/01/2020	0089_PW335_200109	Normal	EP2000249	<0.01	<0.01	<0.01	142	142	665	749	21,300	5.96	2,930	492	1,690	604	13,100
	PW335	30/03/2020	0089_PW335_200330	Normal	EP2003333	0.02	0.02	0.02	271	271	561	664	17,800	8.42	2,560	514	1,580	656	11,300
	PW335	15/07/2020	0089_PW335_200715	Normal	EP2007383	0.02	0.02	0.02	195	195	575	681	18,300	8.41	2,640	530	1,470	611	11,900
	PW335	15/07/2020	0089_QC104_200715	Field Duplicate	EP2007383	0.02	0.02	0.02	194	194	560	636	17,800	6.35	2,590	487	1,400	529	11,100
	PW335	15/07/2020	0089_QC204_200215	Interlab Duplicate	732844	<0.01	<0.05	<0.1	200	200			19,000						
	PW335	22/09/2020	0089_PW335_200922	Normal	EP2010151	0.01	0.01	0.01	136	136	618	691	19,700	5.59	2,840	495	1,550	645	12,000
	PW335	14/12/2020	0089_PW335_201214	Normal	EP2013985	<0.01	<0.01	<0.01	192	192	621	704	19,800	6.19	2,840	511	1,580	679	12,200
	PW335	14/12/2020	0089_QC105_201214	Field Duplicate	EP2013985	<0.01	<0.01	<0.01	192	192	629	734	20,000	7.70	2,940	539	1,660	712	12,700
	PW335	14/12/2020	0089_QC205_201114	Interlab Duplicate	765054	<0.01	<0.05	<0.1	240	240			20,000						

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Table 2 - Pore water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW335	15/03/2021	0089_PW335_210315	Normal	EP2102752	0.07	0.07	0.07	145	145	660	727	21,200	4.77	2,860	508	1,600	674	12,700
	PW335	8/06/2021	0089_PW335_210608	Normal	EP2106465	0.02	0.02	0.02	125	125	581	634	18,600	4.34	2,600	460	1,430	586	11,000
	PW335	30/08/2021	0089_PW335_210830	Normal	EP2110021	<0.01	<0.01	<0.01	114	114	552	562	17,700	0.96	2,400	409	1,260	564	9,740
	PW335	10/01/2022	0089_PW335_220110	Normal	EP2200215	0.02	0.13	0.13	114	114	624	590	20,000	2.77	2,770	417	1,260	532	10,400
	PW335	14/03/2022	0089_PW335_220314	Normal	EP2202977	0.05	0.05	0.05	118	118	628	693	20,200	4.90	2,680	486	1,580	645	12,000
	PW335	7/06/2022	0089_PW335_220607	Normal	EP2206881	0.01	0.01	0.01	164	164	625	567	20,200	4.87	2,490	468	1,310	558	9,690
	PW335	5/09/2022	0089_PW335_220905	Normal	EP2211344	<0.01	<0.01	<0.01	148	148	571	593	18,200	1.88	2,640	414	1,330	589	10,300
	PW340	13/04/2018	0089_PW340_180413	Normal	209417														
	PW340	9/01/2020	0089_PW340_200109	Normal	EP2000249	0.02	0.02	0.02	143	143	645	732	20,600	6.28	2,950	486	1,650	588	12,800
	PW340	30/03/2020	0089_PW340_200330	Normal	EP2003333	<0.01	<0.01	<0.01	282	282	495	588	15,600	8.61	2,350	483	1,380	591	10,000
	PW340	30/03/2020	0089_QC107_200330	Field Duplicate	EP2003333	<0.01	<0.01	<0.01	285	285	495	558	15,600	6.01	2,350	460	1,310	561	9,490
	PW340	30/03/2020	0089_QC207_200330	Interlab Duplicate	711144	<0.01	<0.05	<0.1	320	320			17,000						
	PW340	15/07/2020	0089_PW340_200715	Normal	EP2007383	<0.01	<0.01	<0.01	135	135	578	657	18,400	6.36	2,710	467	1,450	543	11,500
	PW340	22/09/2020	0089_PW340_200922	Normal	EP2010151	0.01	0.01	0.01	130	130	622	722	19,900	7.43	2,780	520	1,630	697	12,500
Fire Training Area	PW340	14/12/2020	0089_PW340_201214	Normal	EP2013988	0.02	0.02	0.02	143	143	642	723	20,400	5.93	3,080	526	1,640	721	12,500
	PW340	15/03/2021	0089_PW340_210315	Normal	EP2102752	*0.28*	0.28	0.28	133	133	685	811	22,000	8.41	2,980	556	1,780	754	14,200
	PW340	8/06/2021	0089_PW340_210608	Normal	EP2106450	0.02	0.02	0.02	111	111	543	648	17,200	8.80	2,670	449	1,440	598	11,300
	PW340	30/08/2021	0089_PW340_210830	Normal	EP2110021	<0.01	<0.01	<0.01	124	124	527	557	16,800	2.74	2,450	406	1,250	558	9,650
	PW340	10/01/2022	0089_PW340_220110	Normal	EP2200215	0.02	0.02	0.02	121	121	623	629	20,000	0.51	2,700	445	1,330	577	11,100
	PW340	14/03/2022	0089_PW340_220314	Normal	EP2202977	0.01	0.01	0.01	128	128	620	720	19,900	7.44	2,720	511	1,630	663	12,500
	PW340	7/06/2022	0089_PW340_220607	Normal	EP2206881	0.03	0.03	0.03	166	166	563	552	18,000	0.97	2,480	454	1,280	554	9,420
	PW340	5/09/2022	0089_PW340_220905	Normal	EP2211344	<0.01	<0.01	<0.01	149	149	563	622	18,000	4.93	2,530	439	1,390	618	10,800
	PW341	13/04/2018	0089_PW341_180413	Normal	209417														
	PW341	8/01/2020	0089_PW341_200108	Normal	EP2000179	<0.01	<0.01	<0.01	127	127	658	657	20,800	0.12	3,310	476	1,440	552	11,500
	PW341	8/01/2020	0089_QC106_200108	Field Duplicate	EP2000179	<0.01	<0.01	<0.01	126	126	645	669	20,600	1.81	2,970	485	1,480	561	11,700
	PW341	8/01/2020	0089_QC206_200108	Interlab Duplicate	696100	<0.01	<0.05	<0.1	160				21,000						
	PW341	31/03/2020	0089_PW341_200331	Normal	EP2003364	<0.01	<0.01	<0.01	375	375	608	698	19,200	6.87	2,850	577	1,620	720	11,900
	PW341	15/07/2020	0089_PW341_200715	Normal	EP2007383	<0.01	<0.01	<0.01	187	187	578	690	18,400	8.90	2,630	531	1,480	619	12,100
	PW341	22/09/2020	0089_PW341_200922	Normal	EP2010151	0.01	0.01	0.01	130	130	614	729	19,600	8.54	2,810	510	1,620	685	12,700
	PW341	22/09/2020	0089_QC115_200922	Field Duplicate	EP2010151	0.01	0.01	0.01	132	132	611	686	19,500	5.80	2,790	488	1,550	647	11,900
Fire Training Area	PW341	22/09/2020	0089_QC215_200921	Interlab Duplicate	746269	<0.01	<0.05	<0.1	120	120			21,000						
	PW341	14/12/2020	0089_PW341_201214	Normal	EP2013988	0.01	0.01	0.01	141	141	637	750	20,200	8.17	3,080	545	1,680	750	13,000
	PW341	15/03/2021	0089_PW341_210315	Normal	EP2102752	0.04	0.04	0.04	116	116	662	744	21,200	5.81	2,960	513	1,640	689	13,000
	PW341	8/06/2021	0089_PW341_210608	Normal	EP2106450	<0.01	<0.01	<0.01	123	123	562	660	17,800	7.97	2,780	463	1,470	607	11,500
	PW341	30/08/2021	0089_PW341_210830	Normal	EP2110021	<0.01	<0.01	<0.01	126	126	534	553	17,100	1.81	2,340	406	1,240	556	9,580
	PW341	10/01/2022	0089_PW341_220110	Normal	EP2200212	0.02	0.02	0.02	102	102	615	606	19,800	0.70	2,610	428	1,280	554	10,700
	PW341	14/03/2022	0089_PW341_220314	Normal	EP2202977	0.02	0.02	0.02	113	113	646	692	20,800	3.43	2,730	488	1,570	633	12,000
	PW341	7/06/2022	0089_PW341_220607	Normal	EP2206881	0.01	0.01	0.01	178	178	561	537	17,900	2.18	2,530	454	1,250	554	9,140
	PW341	5/09/2022	0089_PW341_220905	Normal	EP2211344	0.04	0.04	0.04	133	133	583	611	18,700	2.27	2,560	424	1,370	611	10,600
	PW345	13/04/2018	0089_PW345_180413	Normal	209417														
	PW345	9/01/2020	0089_PW345_200109	Normal	EP2000249	0.02	0.02	0.02	154	154	667	849	21,300	12.0	3,050	621	1,900	866	14,700
	PW345	31/03/2020	0089_PW345_200331	Normal	EP2003374	0.04	0.04	0.04	404	404	200	208	6,170	1.99	870	155	453	213	3,630
	PW345	24/09/2020	0089_PW345_200924	Normal	EP2010271	0.02	0.02	0.02	438	438	649	724	20,600	5.42	2,850	572	1,620	705	12,500
	PW345	15/12/2020	0089_PW345_201215	Normal	EP2014053	0.03	0.03	0.03	425	425	750	903	23,600	9.25	3,660	721	2,000	948	15,600
	PW345	16/03/2021	0089_PW345_210316	Normal	EP2102834	0.02	0.02	0.02	277	277	638	662	20,300	1.86	2,890	516	1,470	610	11,500
Waste water Treatment Plant	PW345	9/06/2021	0089_PW345_210609	Normal	EP2106517	0.02	0.02	0.02	145	145	569	656	18,200	7.13	2,540	470	1,480	604	11,400
	PW345	1/09/2021	0089_PW345_210901	Normal	EP2110154	<0.01	<0.01	<0.01	490	490	448	474	14,200	2.75	1,820	371	1,080	458	8,150
	PW345	10/01/2022	0089_PW345_220110	Normal	EP2200215	0.03	0.03	0.03	446	446	688	681	22,000	0.53	2,820	522	1,450	532	12,000
	PW345	10/01/2022	0089_QC111_220110	Field Duplicate	EP2200215	0.02	0.02	0.02											
	PW345	10/01/2022	0089_QC211_220110	Interlab Duplicate	854607	0.02	<0.05	<0.1											
	PW345	14/03/2022	0089_PW345_220314	Normal	EP2202977	*0.19*	0.19	0.19	148	148	651	696	20,900	3.37	2,790	502	1,560	637	12,100
	PW345	7/06/2022	0089_PW345_220607	Normal	EP2206884	*0.50*	0.50	0.50	131	131	658	618	21,400	3.21	2,510	473	1,430	594	10,600
	PW345	5/09/2022	0089_PW345_220905	Normal	EP2211341	<0.01	<0.01	<0.01	123	123	568	604	18,200	3.05	2,500	415	1,350	592	10,500
	PW346	17/04/2018	0089_PW346_180417	Normal	209522														
	PW346	8/01/2020	0089_PW346_200108	Normal	EP2000186	***2.23***	2.33	2.40	616	616	209	223	6,390	3.28	803	202	493	227	3,840
	PW346	1/04/2020	0089_PW346_200401	Normal	EP2003438	0.01	0.01	0.01	883	883	626	707	19,700	6.12	2,520	628	1,640	748	12,000
	PW346	15/07/2020	0089_PW346_200715	Normal	EP2007386	*0.10*	0.10	0.10	160	160	586	678	18,700	7.23	2,670	491	1,460	604	11,900

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Table 2 - Pore water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Accommodation Area	PW346	22/09/2020	0089_PW346_200922	Normal	EP2010143	***5.62***	5.89	6.06	337	337	333	303	10,600	4.62	1,300	276	693	285	5,180
	PW346	15/12/2020	0089_PW346_201215	Normal	EP2014044	***3.16***	3.36	3.46	153	153	106	108	3,230	0.64	587	90	269	94	1,810
	PW346	17/03/2021	0089_PW346_210317	Normal	EP2102901	*0.12*	0.15	0.15	465	465	609	736	19,300	9.40	2,660	634	1,610	742	12,700
	PW346	10/06/2021	0089_PW346_210610	Normal	EP2106580	0.03	0.03	0.03	271	271	554	600	17,600	4.06	2,490	469	1,380	608	10,300
	PW346	30/08/2021	0089_PW346_210830	Normal	EP2110017	*0.39*	0.39	0.39	142	142	529	571	16,900	3.87	2,370	429	1,290	569	9,870
	PW346	12/01/2022	0089_PW346_220112	Normal	EP2200289	***2.09***	2.20	2.23	307	307	534	570	16,900	3.20	2,480	406	1,240	490	10,000
	PW346	18/03/2022	0089_PW346_220318	Normal	EP2203195	*1.76*	1.88	1.94	1,080	1,080	307	317	9,480	1.64	875	302	724	327	5,390
	PW346	8/06/2022	0089_PW346_220608	Normal	EP2206973	*0.48*	0.49	0.49	313	313	621	675	19,600	4.18	2,960	531	1,600	647	11,500
	PW346	6/09/2022	0089_PW346_220906	Normal	EP2211391	*0.15*	0.17	0.17	151	151	537	615	17,100	6.75	2,480	463	1,380	494	10,700
Waste water Treatment Plant	PW350	19/04/2018	0089_PW350_180419	Normal	209623														
	PW350	30/01/2020	0089_PW350_200130	Normal	EP2001003	0.03	0.03	0.03	118	118	630	675	20,200	3.43	2,800	469	1,510	560	11,800
	PW350	2/04/2020	0089_PW350_200402	Normal	EP2003476	<0.01	<0.01	<0.01	118	118	605	704	19,300	7.51	2,810	509	1,610	758	12,100
	PW350	21/07/2020	0089_PW350_200721	Normal	EP2007594	*0.11*	0.11	0.11	126	126	564	677	17,900	9.09	2,720	478	1,500	639	11,800
	PW350	23/09/2020	0089_PW350_200923	Normal	EP2010220	0.01	0.01	0.01	120	120	635	705	20,300	5.24	2,880	508	1,600	686	12,200
	PW350	16/12/2020	0089_PW350_201216	Normal	EP2014090	<0.01	<0.01	<0.01	118	118	644	691	20,600	3.52	2,900	509	1,590	660	11,900
	PW350	17/03/2021	0089_PW350_210317	Normal	EP2102901	0.05	0.05	0.05	161	161	680	733	21,700	3.74	3,110	527	1,640	750	12,700
	PW350	8/06/2021	0089_PW350_210608	Normal	EP2106450	0.01	0.01	0.01	114	114	567	670	18,000	8.31	2,730	462	1,480	622	11,700
	PW350	30/08/2021	0089_PW350_210830	Normal	EP2110017	<0.01	<0.01	<0.01	119	119	559	595	17,800	3.16	2,600	431	1,340	595	10,300
	PW350	11/01/2022	0089_PW350_220111	Normal	EP2200240	<0.01	<0.01	<0.01	112	112	618	642	19,900	1.89	2,620	427	1,410	510	11,300
	PW350	14/03/2022	0089_PW350_220314	Normal	EP2202980	0.02	0.02	0.02	114	114	573	674	18,600	8.10	2,210	471	1,530	612	11,700
	PW350	7/06/2022	0089_PW350_220607	Normal	EP2206884	<0.01	<0.01	<0.01	124	124	565	580	17,900	1.34	2,770	442	1,350	568	9,950
	PW350	7/09/2022	0089_PW350_220907	Normal	EP2211496	0.01	0.01	0.01	119	119	524	634	16,700	9.55	2,410	438	1,420	495	11,100
Waste water Treatment Plant	PW351	19/04/2018	0089_PW351_180419	Normal	209623														
	PW351	30/01/2020	0089_PW351_200130	Normal	EP2001003	<0.01	<0.01	<0.01	172	172	623	667	19,900	3.38	2,810	462	1,470	546	11,700
	PW351	2/04/2020	0089_PW351_200402	Normal	EP2003474	<0.01	<0.01	<0.01	118	118	589	711	18,700	9.37	2,850	517	1,640	765	12,200
	PW351	21/07/2020	0089_PW351_200721	Normal	EP2007594	0.01	0.01	0.01	125	125	576	684	18,300	8.56	2,760	481	1,530	648	11,900
	PW351	23/09/2020	0089_PW351_200923	Normal	EP2010220	<0.01	<0.01	<0.01	119	119	630	707	20,200	5.72	2,800	509	1,620	690	12,200
	PW351	16/12/2020	0089_PW351_201216	Normal	EP2014090	<0.01	<0.01	<0.01	144	144	629	695	20,100	4.95	2,860	506	1,590	659	12,000
	PW351	17/03/2021	0089_PW351_210317	Normal	EP2102901	0.01	0.01	0.01	141	141	660	708	21,100	3.49	3,000	507	1,580	702	12,300
	PW351	8/06/2021	0089_PW351_210608	Normal	EP2106450	0.01	0.01	0.01	105	105	568	660	18,000	7.48	2,790	459	1,470	613	11,500
	PW351	30/08/2021	0089_PW351_210830	Normal	EP2110017	<0.01	<0.01	<0.01	114	114	550	599	17,600	4.23	2,490	429	1,340	595	10,400
	PW351	11/01/2022	0089_PW351_220111	Normal	EP2200240	<0.01	<0.01	<0.01	119	119	616	641	19,900	1.99	2,510	428	1,400	505	11,300
	PW351	14/03/2022	0089_PW351_220314	Normal	EP2202980	<0.01	<0.01	<0.01	119	119	593	675	19,000	6.48	2,630	478	1,540	619	11,700
	PW351	7/06/2022	0089_PW351_220607	Normal	EP2206881	<0.01	<0.01	<0.01	124	124	553	550	17,700	0.33	2,470	447	1,280	543	9,380
	PW351	7/09/2022	0089_PW351_220907	Normal	EP2211496	<0.01	<0.01	<0.01	120	120	519	625	16,500	9.21	2,480	438	1,410	501	10,900
Waste water Treatment Plant	PW352	19/04/2018	0089_PW352_180419	Normal	209623														
	PW352	30/01/2020	0089_PW352_200130	Normal	EP2001003	<0.01	<0.01	<0.01	120	120	646	663	20,800	1.30	2,720	465	1,470	551	11,600
	PW352	2/04/2020	0089_PW352_200402	Normal	EP2003476	<0.01	<0.01	<0.01	178	178	612	710	19,500	7.42	2,800	514	1,630	762	12,200
	PW352	21/07/2020	0089_PW352_200721	Normal	EP2007594	0.03	0.03	0.03	126	126	567	679	18,000	8.97	2,720	478	1,520	641	11,800
	PW352	23/09/2020	0089_PW352_200923	Normal	EP2010220	<0.01	<0.01	<0.01	124	124	630	672	20,200	3.22	2,770	482	1,540	648	11,600
	PW352	16/12/2020	0089_PW352_201216	Normal	EP2014090	<0.01	<0.01	<0.01	114	114	628	679	20,100	3.84	2,840	499	1,560	643	11,700
	PW352	17/03/2021	0089_PW352_210317	Normal	EP2102901	<0.01	<0.01	<0.01	126	126	656	691	21,000	2.55	2,960	493	1,540	689	12,000
	PW352	8/06/2021	0089_PW352_210608	Normal	EP2106450	<0.01	<0.01	<0.01	116	116	568	676	18,000	8.70	2,770	469	1,500	620	11,800
	PW352	30/08/2021	0089_PW352_210830	Normal	EP2110017	0.02	0.02	0.02	121	121	556	599	17,800	3.71	2,500	433	1,340	594	10,400
	PW352	11/01/2022	0089_PW352_220111	Normal	EP2200240	<0.01	<0.01	<0.01	115	115	604	659	19,400	4.34	2,640	442	1,450	522	11,600
	PW352	14/03/2022	0089_PW352_220314	Normal	EP2202980	<0.01	<0.01	<0.01	120	120	595	658	19,000	5.02	2,720	463	1,500	604	11,400
	PW352	7/06/2022	0089_PW352_220607	Normal	EP2206884	0.02	0.02	0.02	125	125	544	560	17,200	1.38	2,720	427	1,300	535	9,600
	PW352	7/09/2022	0089_PW352_220907	Normal	EP2211496	<0.01	<0.01	<0.01	124	124	522	617	16,600	8.30	2,490	431	1,380	482	10,800
Demolition Ground	PW356	12/04/2018	0089_PW356_180412	Normal	209345														
	PW356	12/04/2018	0089_QC6PW_180412	Field Duplicate	209345														
	PW356	12/04/2018	0089_QC7PW_180412	Interlab Duplicate	594110	0.003	<0.005	<0.005											
	PW356	9/01/2020	0089_QC202_200109	Interlab Duplicate	696324	<0.01	<0.05	<0.1	190				25,000						
	PW356	10/01/2020	0089_PW356_200110	Normal	EP2000252	<0.01	<0.01	<0.01	260	260	671	803	21,400	8.97	2,980	575	1,810	816	13,900
	PW356	10/01/2020	0089_QC102_200110	Field Duplicate	EP2000252	<0.01	<0.01	<0.01	253	253	688	840	21,900	10.0	3,110	611	1,910	856	14,500
	PW356	30/03/2020	0089_PW356_200330	Normal	EP2003308	<0.01	<0.01	<0.01	422	422	711	929	22,600	13.3	3,140	696	2,130	906	16,000
	PW356	20/07/2020	0089_PW356_200720	Normal	EP2007544	<0.01	<0.01	<0.01	121	121	571	685	18,200	9.03	2,670	477	1,500	612	12,000
	PW356	23/09/2020	0089_PW356_200923	Normal	EP2010220	<0.01	<0.01	<0.01	266	266	625	712	19,900	6.48	2,810	523	1,610	709	12,300

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Table 2 - Pore water Analytical Results

						PFAS			Inorganics										
						Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water						*0.07*													
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water						**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	PW356	14/12/2020	0089_PW356_201214	Normal	EP2013973	<0.01	<0.01	<0.01	246	246	596	694	18,900	7.59	2,780	504	1,570	684	12,000
	PW356	16/03/2021	0089_PW356_210316	Normal	EP2102836	<0.01	<0.01	<0.01	317	317	652	768	20,700	8.16	2,960	584	1,720	725	13,300
	PW356	8/06/2021	0089_PW356_210608	Normal	EP2106465	<0.01	0.12	0.12	110	110	590	645	18,900	4.46	2,620	460	1,450	607	11,200
	PW356	30/08/2021	0089_PW356_210830	Normal	EP2110021	<0.01	<0.01	<0.01	201	201	559	584	17,800	2.20	2,540	443	1,310	582	10,100
	PW356	10/01/2022	0089_PW356_220110	Normal	EP2200218	<0.01	<0.01	<0.01	165	165	686	742	22,100	3.88	2,850	474	1,580	534	13,200
	PW356	15/03/2022	0089_PW356_220315	Normal	EP2203019	<0.01	<0.01	<0.01	225	225	624	710	19,900	6.40	2,820	519	1,600	677	12,300
	PW356	8/06/2022	0089_PW356_220608	Normal	EP2206970	*0.10*	0.10	0.10	235	235	572	689	18,200	9.25	2,600	528	1,610	656	11,800
	PW356	5/09/2022	0089_PW356_220905	Normal	EP2211347	<0.01	<0.01	<0.01	144	144	571	619	18,200	4.02	2,640	435	1,390	519	10,800
Demolition Ground	PW357	12/04/2018	0089_PW357_180412	Normal	209345														
	PW357	9/01/2020	0089_QC203_200109	Interlab Duplicate	696324	<0.01	<0.05	<0.1	120				26,000						
	PW357	10/01/2020	0089_PW357_200110	Normal	EP2000252	<0.01	<0.01	<0.01	173	173	717	896	22,900	11.1	3,240	634	2,020	924	15,500
	PW357	10/01/2020	0089_QC103_200110	Field Duplicate	EP2000252	<0.01	<0.01	<0.01	172	172	827	865	26,700	2.25	3,370	608	1,980	916	14,900
	PW357	30/03/2020	0089_PW357_200330	Normal	EP2003308	<0.01	<0.01	<0.01	173	173	634	771	20,200	9.73	2,920	587	1,800	752	13,200
	PW357	20/07/2020	0089_PW357_200720	Normal	EP2007544	<0.01	<0.01	<0.01	189	189	578	690	18,400	8.82	2,670	480	1,510	615	12,100
	PW357	23/09/2020	0089_PW357_200923	Normal	EP2010220	<0.01	<0.01	<0.01	166	166	630	671	20,100	3.18	2,860	481	1,530	656	11,600
	PW357	14/12/2020	0089_PW357_201214	Normal	EP2013989	<0.01	<0.01	<0.01	123	123	625	710	19,900	6.39	2,930	504	1,610	681	12,300
	PW357	16/03/2021	0089_PW357_210316	Normal	EP2102836	<0.01	<0.01	<0.01	142	142	658	707	21,100	3.60	2,890	504	1,580	671	12,300
	PW357	8/06/2021	0089_PW357_210608	Normal	EP2106465	<0.01	<0.01	<0.01	142	142	590	657	18,900	5.37	2,600	490	1,470	616	11,400
	PW357	30/08/2021	0089_PW357_210830	Normal	EP2110017	<0.01	<0.01	<0.01	130	130	536	578	17,100	3.74	2,460	425	1,300	572	10,000
	PW357	10/01/2022	0089_PW357_220110	Normal	EP2200218	<0.01	<0.01	<0.01	120	120	676	740	21,800	4.52	2,810	476	1,560	529	13,200
	PW357	15/03/2022	0089_PW357_220315	Normal	EP2203019	<0.01	<0.01	<0.01	142	142	617	669	19,900	4.02	2,560	470	1,520	630	11,600
	PW357	15/03/2022	0089_QC118_220315	Field Duplicate	EP2203019	<0.01	<0.01	<0.01	134	134	613	692	19,700	6.03	2,640	487	1,570	651	12,000
	PW357	15/03/2022	0089_QC218_220315	Interlab Duplicate	872903	<0.01	<0.05	<0.1											
	PW357	8/06/2022	0089_PW357_220608	Normal	EP2208241	<0.01	<0.01	<0.01											
	PW357	5/09/2022	0089_PW357_220905	Normal	EP2211347	<0.01	<0.01	<0.01	151	151	581	620	18,600	3.18	2,580	437	1,400	503	10,800
Demolition Ground	PW358	12/04/2018	0089_PW358_180412	Normal	209345														
	PW358	10/01/2020	0089_PW358_200110	Normal	EP2000252	<0.01	<0.01	<0.01	176	176	710	847	22,700	8.82	3,170	579	1,900	879	14,700
	PW358	30/03/2020	0089_PW358_200330	Normal	EP2003308	<0.01	<0.01	<0.01	316	316	665	879	21,000	13.8	3,200	771	1,970	857	15,100
	PW358	20/07/2020	0089_PW358_200720	Normal	EP2007544	<0.01	<0.01	<0.01	121	121	555	641	17,700	7.20	2,550	448	1,420	568	11,200
	PW358	23/09/2020	0089_PW358_200923	Normal	EP2010217	<0.01	<0.01	<0.01	175	175	623	721	19,800	7.32	2,920	508	1,630	706	12,500
	PW358	14/12/2020	0089_PW358_201214	Normal	EP2013989	<0.01	<0.01	<0.01	128	128	657	783	20,900	8.79	3,100	548	1,760	762	13,600
	PW358	16/03/2021	0089_PW358_210316	Normal	EP2102836	<0.01	<0.01	<0.01	131	131	663	689	21,200	1.92	2,990	489	1,530	646	12,000
	PW358	16/03/2021	0089_QC113_210316	Field Duplicate	EP2102836	<0.01	<0.01	<0.01	137	137	664	736	21,200	5.12	3,060	529	1,640	704	12,800
	PW358	16/03/2021	0089_QC213_210316	Interlab Duplicate	781350	<0.01	<0.05	<0.1	170				19,000						
	PW358	8/06/2021	0089_PW358_210608	Normal	EP2106465	<0.01	<0.01	<0.01	125	125	595	682	19,000	6.86	2,700	492	1,550	660	11,800
	PW358	8/06/2021	0089_QC107_210608	Field Duplicate	EP2106465	<0.01	<0.01	<0.01	136	136	596	674	19,000	6.19	2,740	498	1,510	638	11,700
	PW358	8/06/2021	0089_QC207_210608	Interlab Duplicate	802464	0.02	<0.05	<0.1	140				20,000						
	PW358	30/08/2021	0089_PW358_210830	Normal	EP2110017	<0.01	<0.01	<0.01	131	131	537	618	17,100	7.01	2,480	457	1,380	614	10,700
	PW358	10/01/2022	0089_PW358_220110	Normal	EP2200218	<0.01	<0.01	<0.01	148	148	697	774	22,400	5.24	3,000	502	1,640	552	13,800
	PW358	15/03/2022	0089_PW358_220315	Normal	EP2203019	<0.01	<0.01	<0.01	190	190	612	692	19,600	6.18	2,650	494	1,570	650	12,000
	PW358	8/06/2022	0089_PW358_220608	Normal	EP2206970	<0.01	<0.01	<0.01	245	245	555	661	17,600	8.70	2,570	514	1,550	623	11,300
	PW358	5/09/2022	0089_PW358_220905	Normal	EP2211347	<0.01	<0.01	<0.01	548	548	581	633	18,500	4.26	2,320	535	1,430	562	10,900
Fire Training Area	PW362	13/04/2018	0089_PW362_180413	Normal	209417														
	PW362	8/01/2020	0089_PW362_200108	Normal	EP2000179	<0.01	<0.01	<0.01	232	232	711	776	22,200	4.39	3,860	556	1,710	645	13,600
	PW362	31/03/2020	0089_PW362_200331	Normal	EP2003364	<0.01	<0.01	<0.01	215	215	555	671	17,500	9.47	2,750	509	1,550	710	11,500
	PW362	15/07/2020	0089_PW362_200715	Normal	EP2007383	<0.01	<0.01	<0.01	130	130	596	717	19,100	9.20	2,630	510	1,540	650	12,600
	PW362	22/09/2020	0089_PW362_200922	Normal	EP2010151	0.01	0.01	0.01	132	132	619	694	19,800	5.73	2,780	501	1,580	676	12,000
	PW362	14/12/2020	0089_PW362_201214	Normal	EP2013988	<0.01	<0.01	<0.01	132	132	630	665	20,000	2.71	3,040	499	1,510	618	11,500
	PW362	15/03/2021	0089_PW362_210315	Normal	EP2102758	*0.23*	0.23	0.23	118	118	614	749	19,500	9.88	2,960	512	1,650	688	13,100
	PW362	8/06/2021	0089_PW362_210608	Normal	EP2106450	0.01	0.01	0.01	128	128	558	642	17,700	6.98	2,720	448	1,430	590	11,200
	PW362	30/08/2021	0089_PW362_210830	Normal	EP2110021	<0.01	<0.01	<0.01	116	116	535	584	17,100	4.38	2,420	425	1,320	586	10,100
	PW362	10/01/2022	0089_PW362_220110	Normal	EP2200212	0.02	0.02	0.02	114	114	642	622	20,600	1.56	2,810	430	1,310	563	11,000
	PW362	14/03/2022	0089_PW362_220314	Normal	EP2202977	0.01	0.01	0.01	116	116	633	692	20,300	4.46	2,770	489	1,570	632	12,000
	PW362	7/06/2022	0089_PW362_220607	Normal	EP2206881	0.04	0.04	0.04	156	156	560	560	17,800	0.02	2,630	456	1,290	553	9,590
	PW362	7/06/2022	0089_QC110_220607	Field Duplicate	EP2206881	0.03	0.03	0.03											
	PW362	7/06/2022	0089_QC210_220607	Interlab Duplicate	896805	0.031	0.033	0.033											
	PW362	5/09/2022	0089_PW362_220905	Normal	EP2211344	<0.01	<0.01	<0.01	127	127	570	537	18,200	3.01	2,600	373	1,200	528	9,330

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Table 2 - Pore water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW362	5/09/2022	0089_QC108_220905	Field Duplicate	EP2211344	<0.01	<0.01	<0.01	133	133	578	598	18,500	1.68	2,560	416	1,330	588	10,400
	PW362	5/09/2022	0089_QC208_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.1											
Fire Training Area	PW363	13/04/2018	0089_PW363_180413	Normal	209417														
	PW363	8/01/2020	0089_PW363_200108	Normal	EP2000179	<0.01	<0.01	<0.01	435	435	802	871	25,600	4.11	3,420	617	1,950	717	15,200
	PW363	31/03/2020	0089_PW363_200331	Normal	EP2003364	0.01	0.01	0.01	310	310	384	446	12,000	7.47	1,890	366	1,030	469	7,610
	PW363	15/07/2020	0089_PW363_200715	Normal	EP2007383	0.02	0.02	0.02	222	222	572	532	18,300	3.61	2,480	414	1,160	461	9,300
	PW363	22/09/2020	0089_PW363_200922	Normal	EP2010151	0.01	0.01	0.01	214	214	699	732	22,600	2.33	2,760	530	1,650	700	12,700
	PW363	14/12/2020	0089_PW363_201214	Normal	EP2013988	<0.01	0.25	0.25	131	131	633	707	20,100	5.52	3,030	517	1,610	692	12,200
	PW363	15/03/2021	0089_PW363_210315	Normal	EP2102752	0.04	0.04	0.04	122	122	662	747	21,200	6.07	2,940	512	1,630	690	13,100
	PW363	8/06/2021	0089_PW363_210608	Normal	EP2106450	<0.01	<0.01	<0.01	120	120	563	654	17,800	7.51	2,810	461	1,460	602	11,400
	PW363	30/08/2021	0089_PW363_210830	Normal	EP2110021	<0.01	<0.01	<0.01	127	127	542	570	17,300	2.52	2,470	415	1,280	573	9,870
	PW363	10/01/2022	0089_PW363_220110	Normal	EP2200212	0.02	0.02	0.02	113	113	621	596	20,000	2.08	2,610	425	1,260	543	10,500
	PW363	14/03/2022	0089_PW363_220314	Normal	EP2202977	0.06	0.06	0.06	128	128	639	732	20,600	6.76	2,670	515	1,660	673	12,700
	PW363	7/06/2022	0089_PW363_220607	Normal	EP2206881	0.01	0.01	0.01	128	128	556	570	17,800	1.22	2,490	462	1,320	566	9,750
	PW363	5/09/2022	0089_PW363_220905	Normal	EP2211344	0.02	0.02	0.02	133	133	583	611	18,600	2.34	2,670	429	1,370	614	10,600
Fire Training Area	PW364	13/04/2018	0089_PW364_180413	Normal	209417														
	PW364	9/01/2020	0089_PW364_200109	Normal	EP2000249	<0.01	<0.01	<0.01	175	175	672	754	21,600	5.76	2,820	495	1,690	612	13,200
	PW364	30/03/2020	0089_PW364_200330	Normal	EP2003333	<0.01	<0.01	<0.01	289	289	500	590	15,800	8.30	2,320	482	1,410	594	10,000
	PW364	30/03/2020	0089_QC105_200330	Field Duplicate	EP2003333	<0.01	<0.01	<0.01	282	282	497	564	15,700	6.29	2,320	459	1,340	568	9,560
	PW364	30/03/2020	0089_QC205_200330	Interlab Duplicate	711144	0.02	<0.05	<0.1	370	370			23,000						
	PW364	15/07/2020	0089_PW364_200715	Normal	EP2007383	0.02	0.02	0.02	128	128	577	657	18,400	6.46	2,670	469	1,450	543	11,500
	PW364	22/09/2020	0089_PW364_200922	Normal	EP2010151	0.01	0.01	0.01	128	128	623	725	19,900	7.55	2,840	517	1,620	688	12,600
	PW364	14/12/2020	0089_PW364_201214	Normal	EP2013985	0.01	0.01	0.01	150	150	617	728	19,600	8.23	2,940	519	1,650	704	12,600
	PW364	15/03/2021	0089_PW364_210315	Normal	EP2102755	0.04	0.04	0.04	120	120	669	735	21,500	4.69	2,880	510	1,640	685	12,800
	PW364	8/06/2021	0089_PW364_210608	Normal	EP2106465	0.02	0.09	0.09	116	116	585	639	18,700	4.41	2,670	461	1,440	592	11,100
	PW364	30/08/2021	0089_PW364_210830	Normal	EP2110021	<0.01	<0.01	<0.01	118	118	542	566	17,400	2.18	2,360	408	1,270	567	9,820
	PW364	30/08/2021	0089_QC106_210830	Field Duplicate	EP2110021	<0.01	<0.01	<0.01	117	117	546	576	17,500	2.69	2,420	414	1,290	577	10,000
	PW364	30/08/2021	0089_QC206_210830	Interlab Duplicate	820919	<0.01	<0.05	<0.1											
	PW364	10/01/2022	0089_PW364_220110	Normal	EP2200215	0.02	0.02	0.02	113	113	628	607	20,200	1.70	2,690	429	1,290	551	10,700
	PW364	14/03/2022	0089_PW364_220314	Normal	EP2202977	0.02	0.02	0.02	122	122	636	716	20,600	5.92	2,510	507	1,630	667	12,400
	PW364	14/03/2022	0089_QC101_220314	Field Duplicate	EP2202977	0.05	0.05	0.05	121	121	633	698	20,300	4.93	2,770	494	1,590	644	12,100
	PW364	14/03/2022	0089_QC201_220314	Interlab Duplicate	872911	<0.01	<0.05	<0.1											
	PW364	7/06/2022	0089_PW364_220607	Normal	EP2206881	0.03	0.03	0.03	148	148	569	592	18,200	2.01	2,530	490	1,380	587	10,100
	PW364	5/09/2022	0089_PW364_220905	Normal	EP2211344	<0.01	<0.01	<0.01	162	162	565	616	18,000	4.32	2,610	430	1,380	622	10,700
Waste wate Treatment Plant	PW367	17/04/2018	0089_PW367_180417	Normal	209522														
	PW367	8/01/2020	0089_PW367_200108	Normal	EP2000186	0.04	0.04	0.04	1,890	1,890	495	541	15,300	4.48	1,220	433	1,220	486	9,350
	PW367	31/03/2020	0089_PW367_200331	Normal	EP2003374	0.05	0.05	0.05	395	395	322	336	10,200	2.06	1,270	297	851	297	5,590
	PW367	15/07/2020	0089_PW367_200715	Normal	EP2007383	<0.01	<0.01	<0.01	129	129	595	690	19,000	7.40	2,710	503	1,490	624	12,100
	PW367	22/09/2020	0089_PW367_200922	Normal	EP2010143	0.04	0.04	0.04	147	147	640	668	20,500	2.16	2,820	462	1,460	628	11,700
	PW367	15/12/2020	0089_PW367_201215	Normal	EP2014048	*0.13*	0.13	0.13	174	174	630	704	20,100	5.49	2,880	503	1,580	700	12,200
	PW367	15/03/2021	0089_PW367_210315	Normal	EP2102758	0.01	0.01	0.04	296	296	658	679	21,000	1.52	2,890	476	1,350	688	12,100
	PW367	9/06/2021	0089_PW367_210609	Normal	EP2106517	0.02	0.02	0.02	176	176	574	675	18,300	8.12	2,600	488	1,530	630	11,700
	PW367	1/09/2021	0089_PW367_210901	Normal	EP2110155	<0.01	<0.01	<0.01	193	193	539	590	17,300	4.58	2,250	482	1,320	552	10,200
	PW367	11/01/2022	0089_QC113_220111	Field Duplicate	EP2200240	0.07	0.07	0.07											
	PW367	11/01/2022	0089_QC213_220111	Interlab Duplicate	855202	*0.08*	0.08	<0.1											
	PW367	11/01/2022	0089-PW367_220111	Normal	EP2200240	0.06	0.06	0.06	718	718	658	693	21,000	2.56	2,490	554	1,520	550	12,100
	PW367	14/03/2022	0089_PW367_220314	Normal	EP2202977	0.01	0.01	0.01			657	716		4.32		556	1,610	662	12,400
	PW367	7/06/2022	0089_PW367_220607	Normal	EP2206884	*0.30*	0.30	0.30	129	129	582	598	18,600	1.39	2,620	459	1,370	567	10,300
	PW367	5/09/2022	0089_PW367_220905	Normal	EP2211341	0.01	0.01	0.01	128	128	568	592	18,200	2.05	2,490	402	1,320	582	10,300
	PW367	5/09/2022	0089_QC110_220905	Field Duplicate	EP2211341	<0.01	<0.01	<0.01	129	129	551	592	17,700	3.56	2,370	407	1,320	582	10,300
	PW367	5/09/2022	0089_QC210_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.1											
	PW368	17/04/2018	0089_PW368_180417	Normal	209522														
	PW368	8/01/2020	0089_PW368_200108	Normal	EP2000186	0.02	0.10	0.10	256	256	445	490	14,200	4.74	1,900	351	1,130	468	8,440
	PW368	1/04/2020	0089_PW368_200401	Normal	EP2003438	<0.01	<0.01	<0.01	181	181	480	529	15,200	4.81	2,300	389	1,230	568	9,050
	PW368	1/04/2020	0089_QC102_200401	Field Duplicate	EP2003438	<0.01	<0.01	<0.01	179	179	502	598	16,000	8.74	2,270	432	1,330	587	10,400
	PW368	1/04/2020	0089_QC202_200401	Interlab Duplicate	711709	0.01	<0.05	<0.1	200	200			17,000						
	PW368	20/07/2020	0089_PW368_200720	Normal	EP2007544	0.01	0.01	0.01	216	216	502	591	16,000	8.17	2,220	460	1,300	518	10,300

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Table 2 - Pore water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Waste water Treatment Plant	PW368	22/09/2020	0089_PW368_200922	Normal	EP2010143	0.04	0.04	0.04	208	208	428	414	13,700	1.68	1,780	317	925	397	7,160
	PW368	15/12/2020	0089_PW368_201215	Normal	EP2014048	0.05	0.05	0.05	258	258	564	587	17,900	1.98	2,580	446	1,340	578	10,100
	PW368	15/03/2021	0089_PW368_210315	Normal	EP2102758	0.04	0.04	0.04	102	102	592	707	18,800	8.83	2,860	481	1,540	645	12,400
	PW368	15/03/2021	0089_QC102_210315	Field Duplicate	EP2102758	0.03	0.03	0.03	112	112	639	660	20,500	1.59	2,810	421	1,310	686	11,800
	PW368	15/03/2021	0089_QC202_210315	Interlab Duplicate	781350	0.02	<0.05	<0.1	120				21,000						
	PW368	10/06/2021	0089_PW368_210610	Normal	EP2106582	0.01	0.01	0.01	219	219	506	563	16,200	5.35	2,150	446	1,310	530	9,650
	PW368	1/09/2021	0089_PW368_210901	Normal	EP2110155	0.02	0.02	0.02	123	123	552	646	17,800	7.77	2,300	458	1,460	599	11,200
	PW368	11/01/2022	0089_PW368_220111	Normal	EP2200240	0.07	0.07	0.07	195	195	278	277	8,810	0.22	1,240	206	623	226	4,820
	PW368	18/03/2022	0089_PW368_220318	Normal	EP2203195	0.05	0.05	0.05	158	158	607	639	19,400	2.52	2,740	471	1,440	547	11,100
	PW368	8/06/2022	0089_PW368_220608	Normal	EP2206973	*0.33*	0.33	0.33	128	128	601	676	19,100	5.91	2,850	489	1,590	639	11,600
	PW368	5/09/2022	0089_PW368_220905	Normal	EP2211344	<0.01	<0.01	<0.01	369	369	80.0	76.9	2,270	1.98	414	111	171	81	1,270
	PW368	5/09/2022	0089_QC118_220905	Field Duplicate	EP2211344	0.03	0.03	0.03	287	287	488	482	15,600	0.62	2,050	394	1,100	456	8,290
	PW368	5/09/2022	0089_QC218_220905	Interlab Duplicate	920981	0.02	<0.05	<0.1											
Waste water Treatment Plant	PW369	17/04/2018	0089_PW369_180417	Normal	209522														
	PW369	9/01/2020	0089_PW369_200109	Normal	EP2000249	0.02	0.02	0.02	136	136	693	866	22,200	11.0	3,100	604	1,940	920	15,000
	PW369	31/03/2020	0089_PW369_200331	Normal	EP2003374	0.01	0.01	0.01	469	469	186	177	5,680	2.56	801	166	444	167	2,940
	PW369	15/07/2020	0089_PW369_200715	Normal	EP2007383	0.04	0.04	0.04	128	128	598	728	19,100	9.80	2,710	518	1,560	650	12,800
	PW369	24/09/2020	0089_PW369_200924	Normal	EP2010271	<0.01	<0.01	<0.01	199	199	636	692	20,300	4.28	2,840	519	1,550	670	12,000
	PW369	15/12/2020	0089_PW369_201215	Normal	EP2014053	*0.69*	0.89	0.89	189	189	625	701	19,800	5.74	3,020	528	1,590	698	12,100
	PW369	16/03/2021	0089_PW369_210316	Normal	EP2102834	<0.01	<0.01	<0.01	179	179	651	712	20,800	4.50	2,920	524	1,580	662	12,400
	PW369	9/06/2021	0089_PW369_210609	Normal	EP2106517	0.01	0.01	0.01	130	130	581	692	18,600	8.70	2,600	491	1,570	645	12,000
	PW369	1/09/2021	0089_PW369_210901	Normal	EP2110154	<0.01	<0.01	<0.01	317	317	255	260	7,940	1.06	1,170	208	594	269	4,460
	PW369	1/09/2021	0089_QC118_210901	Field Duplicate	EP2110154	<0.01	<0.01	<0.01	308	308	248	262	7,740	2.78	1,120	208	598	276	4,490
	PW369	1/09/2021	0089_QC218_210901	Interlab Duplicate	822579	0.01	<0.05	<0.1											
	PW369	10/01/2022	0089_PW369_220110	Normal	EP2200215	0.06	0.06	0.06	207	207	665	651	21,300	1.04	2,880	485	1,380	519	11,500
	PW369	14/03/2022	0089_PW369_220314	Normal	EP2202977	0.07	0.07	0.07	163	163	642	722	20,600	5.90	2,760	532	1,640	670	12,500
	PW369	7/06/2022	0089_PW369_220607	Normal	EP2206884	*0.20*	0.20	0.20	139	139	580	630	18,600	4.16	2,510	479	1,470	602	10,800
	PW369	5/09/2022	0089_PW369_220905	Normal	EP2211341	*0.11*	0.11	0.11	124	124	561	621	18,000	5.10	2,440	428	1,390	618	10,800
Dredge Spoil and Careening Bay	PW374	18/04/2018	0089_PW374_180418	Normal	209573														
	PW374	8/01/2020	0089_PW374_200108	Normal	EP2000186	0.01	0.01	0.01	156	156	616	708	19,700	6.93	2,750	459	1,590	574	12,400
	PW374	8/01/2020	0089_QC108_200108	Field Duplicate	EP2000186	<0.01	<0.01	<0.01	152	152	645	733	20,800	6.33	2,670	484	1,660	591	12,800
	PW374	8/01/2020	0089_QC208_200108	Interlab Duplicate	696100	<0.01	<0.05	<0.1	180				20,000						
	PW374	30/03/2020	0089_PW374_200330	Normal	EP2003313	*0.44*	0.44	0.44	330	330	282	288	8,840	1.13	1,250	204	676	286	4,950
	PW374	21/07/2020	0089_PW374_200721	Normal	EP2007611	<0.01	<0.01	<0.01	126	126	569	673	18,100	8.39	2,690	479	1,510	636	11,700
	PW374	21/09/2020	0089_PW374_200921	Normal	EP2010085	0.01	0.01	0.01	125	125	552	635	17,400	7.03	2,800	422	1,460	602	11,000
	PW374	21/09/2020	0089_QC103_200921	Field Duplicate	EP2010085	0.02	0.02	0.02	123	123	565	677	17,900	8.96	2,790	446	1,570	640	11,700
	PW374	21/09/2020	0089_QC203_200921	Interlab Duplicate	746269	<0.01	<0.05	<0.1	160	160			17,000						
	PW374	14/12/2020	0089_PW374_201214	Normal	EP2013989	<0.01	<0.01	<0.01	126	126	674	772	21,500	6.78	3,140	546	1,740	749	13,400
	PW374	15/03/2021	0089_PW374_210315	Normal	EP2102758	0.04	0.04	0.04	119	119	657	687	21,100	2.26	2,860	452	1,360	702	12,300
	PW374	15/03/2021	0089_QC106_210315	Field Duplicate	EP2102758	0.02	0.02	0.02	114	114	591	721	18,800	9.88	2,820	499	1,590	668	12,600
	PW374	15/03/2021	0089_QC206_210315	Interlab Duplicate	781350	*0.11*	0.13	0.13	140				21,000						
	PW374	10/06/2021	0089_PW374_210610	Normal	EP2106582	*0.08*	0.08	0.08	120	120	578	662	18,500	6.78	2,600	462	1,500	618	11,500
	PW374	1/09/2021	0089_PW374_210901	Normal	EP2110154	0.01	0.01	0.01	118	118	548	620	17,700	6.17	2,240	436	1,390	566	10,800
	PW374	13/01/2022	0089_PW374_220113	Normal	EP2200343	*0.08*	0.08	0.08	129	129	612	686	19,700	5.72	2,560	455	1,530	593	12,000
	PW374	16/03/2022	0089_PW374_220316	Normal	EP2203058	<0.01	<0.01	<0.01	138	138	634	647	20,400	1.01	2,700	454	1,480	618	11,200
	PW374	9/06/2022	0089_PW374_220609	Normal	EP2207029	<0.01	<0.01	<0.01	122	122	528	630	16,800	8.81	2,460	455	1,480	595	10,800
	PW374	6/09/2022	0089_PW374_220906	Normal	EP2211391	0.01	0.01	0.01	127	127	548	613	17,400	5.56	2,640	426	1,380	493	10,700
Dredge Spoil and Careening Bay	PW375	18/04/2018	0089_PW375_180418	Normal	209573														
	PW375	8/01/2020	0089_PW375_200108	Normal	EP2000186	0.03	0.03	0.03	231	231	372	444	11,800	8.74	1,670	333	990	481	7,660
	PW375	30/03/2020	0089_PW375_200330	Normal	EP2003313	*0.09*	0.09	0.09	139	139	586	684	18,700	7.73	2,670	512	1,610	667	11,700
	PW375	21/07/2020	0089_PW375_200721	Normal	EP2007611	0.02	0.02	0.02	124	124	572	646	18,300	6.05	2,570	512	1,410	670	11,200
	PW375	21/09/2020	0089_PW375_200921	Normal	EP2010085	0.01	0.01	0.01	123	123	561	646	17,700	6.98	2,860	424	1,480	604	11,200
	PW375	14/12/2020	0089_PW375_201214	Normal	EP2013989	0.02	0.02	0.02	120	120	642	733	20,400	6.64	3,070	520	1,660	707	12,700
	PW375	14/12/2020	0089_QC109_201214	Field Duplicate	EP2013989	0.02	0.02	0.02	117	117	637	649	20,300	0.94	2,980	478	1,490	606	11,200
	PW375	14/12/2020	0089_QC209_201114	Interlab Duplicate	765054	0.02	<0.05	<0.1	150	150			33,000						
	PW375	15/03/2021	0089_PW375_210315	Normal	EP2102758	0.03	0.03	0.03	116	116	642	672	20,600	2.28	2,800	435	1,340	692	12,000
	PW375	10/06/2021	0089_PW375_210610	Normal	EP2106582	0.02	0.02	0.02	118	118	581	691	18,600	8.63	2,610	485	1,560	649	12,000

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Table 2 - Pore water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW375	10/06/2021	0089_QC118_210610	Field Duplicate	EP2106582	0.06	0.06	0.06	124	124	576	692	18,400	9.11	2,640	483	1,570	654	12,000
	PW375	10/06/2021	0089_QC218_210610	Interlab Duplicate	802734	<0.01	<0.05	<0.1	130	130			20,000						
	PW375	1/09/2021	0089_PW375_210901	Normal	EP2110154	0.05	0.05	0.05	119	119	547	656	17,500	9.10	2,430	460	1,480	603	11,400
	PW375	13/01/2022	0089_PW375_220113	Normal	EP2200343	<0.01	<0.01	<0.01	137	137	574	638	18,700	5.32	2,090	428	1,410	536	11,200
	PW375	16/03/2022	0089_PW375_220316	Normal	EP2203058	0.01	0.01	0.01	183	183	518	541	16,600	2.23	2,190	392	1,230	517	9,360
	PW375	9/06/2022	0089_PW375_220609	Normal	EP2207029	<0.01	<0.01	<0.01	122	122	627	630	20,300	0.22	2,480	456	1,480	593	10,800
	PW375	6/09/2022	0089_PW375_220906	Normal	EP2211391	0.03	0.03	0.03	210	210	523	561	16,700	3.54	2,290	416	1,270	468	9,750
Dredge Spoil and Careening Bay	PW378	17/04/2018	0089_PW378_180417	Normal	209522														
	PW378	8/01/2020	0089_PW378_200108	Normal	EP2000186	*0.12*	0.12	0.12	125	125	603	685	19,400	6.35	2,570	446	1,540	552	12,000
	PW378	30/03/2020	0089_PW378_200330	Normal	EP2003313	*0.10*	0.10	0.10	223	223	273	292	8,660	3.29	1,180	235	701	280	4,950
	PW378	21/07/2020	0089_PW378_200721	Normal	EP2007611	<0.01	<0.01	<0.01	113	113	572	656	18,200	6.79	2,720	511	1,420	682	11,400
	PW378	21/09/2020	0089_PW378_200921	Normal	EP2010085	<0.01	<0.01	<0.01	118	118	554	679	17,500	10.1	2,810	479	1,520	656	11,800
	PW378	14/12/2020	0089_PW378_201214	Normal	EP2013989	0.02	0.02	0.02	112	112	626	726	19,900	7.41	3,000	509	1,640	696	12,600
	PW378	15/03/2021	0089_PW378_210315	Normal	EP2102758	0.02	0.02	0.02	102	102	639	661	20,500	1.68	2,810	432	1,320	675	11,800
	PW378	10/06/2021	0089_PW378_210610	Normal	EP2106582	0.05	0.05	0.05	131	131	581	669	18,600	7.06	2,580	470	1,520	630	11,600
	PW378	1/09/2021	0089_PW378_210901	Normal	EP2110154	0.01	0.01	0.01	119	119	557	650	18,000	7.69	2,240	453	1,460	598	11,300
	PW378	13/01/2022	0089_PW378_220113	Normal	EP2200343	<0.01	<0.01	<0.01	123	123	614	718	19,800	7.81	2,570	481	1,590	612	12,600
	PW378	16/03/2022	0089_PW378_220316	Normal	EP2203058	<0.01	<0.01	<0.01	165	165	557	576	17,800	1.69	2,490	408	1,320	556	9,960
	PW378	9/06/2022	0089_PW378_220609	Normal	EP2207029	<0.01	<0.01	<0.01	122	122	550	618	17,600	5.74	2,480	447	1,450	581	10,600
	PW378	6/09/2022	0089_PW378_220906	Normal	EP2211391	0.02	0.02	0.02	131	131	549	629	17,500	6.84	2,520	441	1,410	502	11,000
Waste water Treatment Plant	PW380	19/04/2018	0089_PW380_180419	Normal	209623														
	PW380	30/01/2020	0089_PW380_200130	Normal	EP2001003	<0.01	<0.01	<0.01	125	125	629	680	20,100	3.93	2,840	476	1,510	562	11,900
	PW380	2/04/2020	0089_PW380_200402	Normal	EP2003476	0.05	0.05	0.05	118	118	608	721	19,400	8.52	2,810	528	1,650	778	12,400
	PW380	21/07/2020	0089_PW380_200721	Normal	EP2007594	0.05	0.05	0.05	124	124	576	678	18,300	8.05	2,780	475	1,510	638	11,800
	PW380	23/09/2020	0089_PW380_200923	Normal	EP2010217	0.04	0.04	0.04	122	122	610	678	19,400	5.21	2,920	485	1,550	660	11,700
	PW380	16/12/2020	0089_PW380_201216	Normal	EP2014090	<0.01	<0.01	<0.01	121	121	639	673	20,400	2.60	2,950	498	1,550	645	11,600
	PW380	17/03/2021	0089_PW380_210317	Normal	EP2102901	<0.01	<0.01	<0.01	137	137	708	719	22,700	0.76	3,140	510	1,600	723	12,500
	PW380	8/06/2021	0089_PW380_210608	Normal	EP2106450	<0.01	<0.01	<0.01	120	120	588	657	18,800	5.57	2,640	466	1,480	630	11,400
	PW380	30/08/2021	0089_PW380_210830	Normal	EP2110017	*0.14*	0.14	0.14	119	119	553	599	17,700	4.00	2,470	429	1,340	592	10,400
	PW380	11/01/2022	0089_PW380_220111	Normal	EP2200240	<0.01	<0.01	<0.01	114	114	606	659	19,500	4.13	2,600	430	1,450	522	11,600
	PW380	14/03/2022	0089_PW380_220314	Normal	EP2202980	<0.01	<0.01	<0.01	119	119	575	680	18,300	8.33	2,710	474	1,540	621	11,800
	PW380	7/06/2022	0089_PW380_220607	Normal	EP2206881	<0.01	<0.01	<0.01	132	132	569	576	18,200	0.64	2,530	467	1,340	580	9,830
	PW380	7/09/2022	0089_PW380_220907	Normal	EP2211496	0.06	0.06	0.06	115	115	522	613	16,600	7.99	2,470	426	1,380	484	10,700
Waste water Treatment Plant	PW381	19/04/2018	0089_PW381_180419	Normal	209623														
	PW381	30/01/2020	0089_PW381_200130	Normal	EP2001003	<0.01	<0.01	<0.01	120	120	634	668	20,300	2.63	2,810	460	1,480	552	11,700
	PW381	2/04/2020	0089_PW381_200402	Normal	EP2003474	<0.01	<0.01	<0.01	119	119	643	729	20,600	6.28	2,860	510	1,660	745	12,600
	PW381	21/07/2020	0089_PW381_200721	Normal	EP2007594	0.05	0.05	0.05	125	125	578	683	18,400	8.34	2,720	482	1,520	649	11,900
	PW381	23/09/2020	0089_PW381_200923	Normal	EP2010217	<0.01	<0.01	<0.01	188	188	612	686	19,400	5.72	2,920	480	1,550	661	11,900
	PW381	16/12/2020	0089_PW381_201216	Normal	EP2014104	<0.01	<0.01	<0.01	113	113	626	665	20,000	3.08	2,840	475	1,520	635	11,500
	PW381	17/03/2021	0089_PW381_210317	Normal	EP2102901	<0.01	<0.01	<0.01	125	125	632	697	20,200	4.87	2,870	504	1,550	696	12,100
	PW381	8/06/2021	0089_PW381_210608	Normal	EP2106450	0.01	0.01	0.01	115	115	568	660	18,000	7.48	2,780	458	1,470	613	11,500
	PW381	30/08/2021	0089_PW381_210830	Normal	EP2110017	0.02	0.02	0.02	119	119	554	640	17,700	7.22	2,490	462	1,430	631	11,100
	PW381	11/01/2022	0089_PW381_220111	Normal	EP2200240	<0.01	<0.01	<0.01	118	118	615	626	19,800	0.87	2,600	420	1,380	499	11,000
	PW381	14/03/2022	0089_PW381_220314	Normal	EP2202980	<0.01	<0.01	<0.01	118	118	568	644	18,300	6.20	2,400	459	1,490	602	11,100
	PW381	7/06/2022	0089_PW381_220607	Normal	EP2206884	<0.01	<0.01	<0.01	124	124	550	640	17,600	7.59	2,440	481	1,480	615	11,000
	PW381	7/09/2022	0089_PW381_220907	Normal	EP2211496	<0.01	<0.01	<0.01	120	120	524	612	16,700	7.74	2,450	421	1,380	487	10,700
Waste water Treatment Plant	PW401	19/04/2018	0089_PW379_180419	Normal	209623														
	PW401	30/01/2020	0089_PW401_200130	Normal	EP2001003	<0.01	<0.01	<0.01	122	122	623	663	19,900	3.12	2,850	453	1,480	556	11,600
	PW401	2/04/2020	0089_PW401_200402	Normal	EP2003474	<0.01	<0.01	<0.01	117	117	586	686	18,600	7.85	2,840	496	1,570	735	11,800
	PW401	21/07/2020	0089_PW401_200721	Normal	EP2007594	0.07	0.07	0.07	124	124	578	650	18,400	5.94	2,690	462	1,460	616	11,300
	PW401	23/09/2020	0089_PW401_200923	Normal	EP2010220	0.02	0.02	0.02	118	118	636	701	20,400	4.87	2,800	499	1,610	683	12,100
	PW401	16/12/2020	0089_PW401_201216	Normal	EP2014090	<0.01	<0.01	<0.01	122	122	632	667	20,200	2.66	2,890	493	1,530	635	11,500
	PW401	17/03/2021	0089_PW401_210317	Normal	EP2102901	<0.01	<0.01	<0.01	130	130	663	675	21,200	0.91	2,980	487	1,510	680	11,700
	PW401	8/06/2021	0089_PW401_210608	Normal	EP2106450	0.03	0.03	0.03	116	116	573	653	18,200	6.51	2,760	450	1,450	598	11,400
	PW401	30/08/2021	0089_PW401_210830	Normal	EP2110017	<0.01	<0.01	<0.01	118	118	548	628	17,500	6.79	2,490	453	1,400	617	10,900
	PW401	11/01/2022	0089_PW401_220111	Normal	EP2200240	<0.01	<0.01	<0.01	114	114	615	642	19,800	2.11	2,620	426	1,410	510	11,300
	PW401	14/03/2022	0089_PW401_220314	Normal	EP2202980	0.01	0.01	0.01	127	127	584	656	18,700	5.74	2,610	456	1,480	593	11,400

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Table 2 - Pore water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	PW401	7/06/2022	0089_PW401_220607	Normal	EP2206881	<0.01	<0.01	<0.01	124	124	555	577	17,700	1.97	2,550	469	1,330	568	9,880
	PW401	7/09/2022	0089_PW401_220907	Normal	EP2211496	<0.01	<0.01	<0.01	119	119	523	628	16,600	9.11	2,510	429	1,400	492	11,000
Helicopter Support Facility	PW405	14/01/2020	0089_PW405_200114	Normal	EP2000432	<0.01	<0.01	<0.01	125	125	658	790	21,000	9.07	3,050	551	1,770	809	13,700
	PW405	1/04/2020	0089_PW405_200401	Normal	EP2003417	<0.01	<0.01	<0.01	166	166	677	770	21,700	6.38	2,980	575	1,800	736	13,200
	PW405	22/07/2020	0089_PW405_200722	Normal	EP2007648	<0.01	<0.01	<0.01	150	150	600	585	19,300	1.24	2,510	397	1,250	558	10,300
	PW405	21/09/2020	0089_PW405_200921	Normal	EP2010085	<0.01	<0.01	<0.01	136	136	563	716	17,700	11.9	2,930	516	1,610	701	12,400
	PW405	21/09/2020	0089_QC110_200921	Field Duplicate	EP2010085	<0.01	<0.01	<0.01	139	139	566	721	17,900	12.0	2,820	520	1,620	706	12,500
	PW405	21/09/2020	0089_QC210_200921	Interlab Duplicate	746269	<0.01	<0.05	<0.1	120	120			19,000						
	PW405	15/12/2020	0089_PW405_201215	Normal	EP2014048	0.01	0.01	0.01	133	133	647	704	20,700	4.18	2,910	505	1,580	692	12,200
	PW405	15/03/2021	0089_PW405_210315	Normal	EP2102752	<0.01	<0.01	<0.01	105	105	662	709	21,200	3.45	2,950	486	1,560	660	12,400
	PW405	10/06/2021	0089_PW405_210610	Normal	EP2106590	<0.01	0.11	0.14	206	206	164	159	5,130	1.26	707	254	378	135	2,580
	PW405	10/06/2021	0089_QC115_210610	Field Duplicate	EP2106590	<0.01	0.12	0.12	190	190	173	154	5,440	5.61	750	246	366	131	2,500
	PW405	10/06/2021	0089_QC215_210610	Interlab Duplicate	802734	<0.01	0.11	0.11	200	200			6,400						
	PW405	31/08/2021	0089_PW405_210831	Normal	EP2110065	<0.01	0.04	0.04	132	132	558	581	17,900	2.01	2,410	407	1,310	515	10,100
	PW405	31/08/2021	0089_QC117_210831	Field Duplicate	EP2110065	<0.01	0.02	0.02	133	133	549	592	17,600	3.75	2,400	417	1,330	531	10,300
	PW405	31/08/2021	0089_QC217_210831	Interlab Duplicate	821197	<0.01	0.05	<0.1											
	PW405	14/01/2022	0089_PW405_220114	Normal	EP2200400	<0.01	<0.01	<0.01	122	122	626	663	20,100	2.93	2,700	457	1,470	588	11,600
	PW405	16/03/2022	0089_PW405_220316	Normal	EP2203058	<0.01	0.08	0.08	157	157	650	705	20,800	4.02	2,910	488	1,610	682	12,200
	PW405	7/06/2022	0089_PW405_220607	Normal	EP2206887	<0.01	<0.01	<0.01	130	130	599	703	19,200	7.97	2,640	505	1,640	644	12,100
	PW405	7/09/2022	0089_PW405_220907	Normal	EP2211496	<0.01	<0.01	<0.01	117	117	515	623	16,400	9.53	2,400	434	1,400	487	10,900
Helicopter Support Facility	PW407	14/01/2020	0089_PW407_200114	Normal	EP2000432	<0.01	<0.01	<0.01	174	174	622	762	19,800	10.2	2,860	536	1,720	783	13,200
	PW407	1/04/2020	0089_PW407_200401	Normal	EP2003417	0.02	1.46	1.46	206	206	536	617	17,100	7.02	2,390	455	1,380	606	10,700
	PW407	22/07/2020	0089_PW407_200722	Normal	EP2007648	<0.01	<0.01	<0.01	156	156	524	549	16,700	2.30	2,390	376	1,170	523	9,660
	PW407	21/09/2020	0089_PW407_200921	Normal	EP2010085	0.01	0.01	0.01	133	133	566	674	17,800	8.74	2,930	449	1,540	630	11,700
	PW407	15/12/2020	0089_PW407_201215	Normal	EP2014053	<0.01	<0.01	<0.01	136	136	638	710	20,200	5.39	3,130	516	1,600	700	12,300
	PW407	15/03/2021	0089_PW407_210315	Normal	EP2102752	<0.01	<0.01	<0.01	110	110	649	714	20,800	4.77	2,890	488	1,570	659	12,500
	PW407	10/06/2021	0089_PW407_210610	Normal	EP2106590	<0.01	<0.01	0.02	189	189	537	611	17,200	6.46	2,310	445	1,370	597	10,600
	PW407	31/08/2021	0089_PW407_210831	Normal	EP2110065	<0.01	<0.01	<0.01	135	135	556	581	17,800	2.22	2,440	408	1,310	521	10,100
	PW407	14/01/2022	0089_PW407_220114	Normal	EP2200400	<0.01	<0.01	<0.01	101	101	633	664	20,400	2.38	2,690	457	1,480	593	11,600
	PW407	16/03/2022	0089_PW407_220316	Normal	EP2203058	<0.01	<0.01	<0.01	110	110	616	664	19,600	3.74	2,950	458	1,520	636	11,500
	PW407	7/06/2022	0089_PW407_220607	Normal	EP2206887	<0.01	<0.01	<0.01	195	195	477	564	15,000	8.40	2,400	416	1,320	517	9,700
	PW407	7/09/2022	0089_PW407_220907	Normal	EP2211498	<0.01	<0.01	<0.01	123	123	554	606	17,700	4.48	2,520	420	1,360	481	10,600
Helicopter Support Facility	PW409	14/01/2020	0089_PW409_200114	Normal	EP2000432	<0.01	<0.01	<0.01	138	138	651	774	20,700	8.59	3,100	551	1,740	783	13,400
	PW409	1/04/2020	0089_PW409_200401	Normal	EP2003417	<0.01	<0.01	<0.01	145	145	625	760	20,000	9.74	2,800	554	1,690	763	13,200
	PW409	21/07/2020	0089_PW409_200721	Normal	EP2007611	<0.01	<0.01	<0.01	137	137	552	622	17,500	6.02	2,650	485	1,360	641	10,800
	PW409	22/09/2020	0089_PW409_200922	Normal	EP2010143	<0.01	<0.01	<0.01	126	126	626	662	20,100	2.79	2,740	455	1,450	622	11,600
	PW409	22/09/2020	0089_QC113_200922	Field Duplicate	EP2010143	<0.01	<0.01	<0.01	128	128	611	662	19,600	3.94	2,690	455	1,440	620	11,600
	PW409	22/09/2020	0089_QC213_200921	Interlab Duplicate	746269	<0.01	<0.05	<0.1	110	110			18,000						
	PW409	15/12/2020	0089_PW409_201215	Normal	EP2014044	<0.01	<0.01	<0.01	123	123	615	724	19,600	8.14	2,850	504	1,620	667	12,600
	PW409	17/03/2021	0089_PW409_210317	Normal	EP2102901	<0.01	<0.01	<0.01	138	138	714	828	22,800	7.43	3,270	585	1,840	844	14,400
	PW409	10/06/2021	0089_PW409_210610	Normal	EP2106590	0.01	0.01	0.01	113	113	583	658	18,700	5.99	2,580	475	1,480	642	11,400
	PW409	31/08/2021	0089_PW409_210831	Normal	EP2110065	<0.01	<0.01	<0.01	124	124	553	586	17,700	2.90	2,470	414	1,320	521	10,200
	PW409	14/01/2022	0089_PW409_220114	Normal	EP2200400	<0.01	<0.01	<0.01	130	130	631	654	20,300	1.81	2,660	460	1,460	584	11,400
	PW409	16/03/2022	0089_PW409_220316	Normal	EP2203058	<0.01	<0.01	<0.01	229	229	504	514	16,000	0.98	2,300	393	1,180	488	8,840
	PW409	7/06/2022	0089_PW409_220607	Normal	EP2206887	<0.01	<0.01	<0.01	155	155	562	685	17,800	9.86	2,730	496	1,590	631	11,800
	PW409	6/09/2022	0089_PW409_220906	Normal	EP2211391	<0.01	<0.01	<0.01	159	159	546	652	17,400	8.88	2,500	462	1,460	525	11,400
Helicopter Support Facility	PW411	14/01/2020	0089_PW411_200114	Normal	EP2000432	<0.01	<0.01	<0.01	121	121	575	698	18,100	9.67	2,960	557	1,600	632	12,000
	PW411	1/04/2020	0089_PW411_200401	Normal	EP2003417	<0.01	<0.01	<0.01	128	128	614	717	19,600	7.76	2,800	523	1,630	681	12,400
	PW411	21/07/2020	0089_PW411_200721	Normal	EP2007611	<0.01	<0.01	<0.01	127	127	577	656	18,400	6.44	2,660	508	1,430	681	11,400
	PW411	22/09/2020	0089_PW411_200922	Normal	EP2010143	<0.01	<0.01	<0.01	118	118	630	640	20,200	0.75	2,780	436	1,400	603	11,200
	PW411	15/12/2020	0089_PW411_201215	Normal	EP2014044	<0.01	<0.01	<0.01	120	120	616	694	19,600	5.94	2,940	484	1,550	637	12,100
	PW411	18/03/2021	0089_PW411_210318	Normal	EP2102956	<0.01	<0.01	<0.01	137	137	634	634	20,300	0.03	2,800	457	1,430	592	11,000
	PW411	9/06/2021	0089_PW411_210609	Normal	EP2106519	<0.01	<0.01	<0.01	115	115	587	674	18,800	6.88	2,630	479	1,520	633	11,700
	PW411	1/09/2021	0089_PW411_210901	Normal	EP2110154	<0.01	<0.01	<0.01	121	121	561	650	18,100	7.37	2,290	456	1,460	604	11,300
	PW411	14/01/2022	0089_PW411_220114	Normal	EP2200400	<0.01	<0.01	<0.01	111	111	635	630	20,500	0.44	2,630	436	1,400	558	11,000
	PW411	16/03/2022	0089_PW411_220316	Normal	EP2203058	<0.01	<0.01	<0.01	129	129	616	705	19,600	6.74	2,900	486	1,610	680	12,200
	PW411	7/06/2022	0089_PW411_220607	Normal	EP2206887	<0.01	<0.01	<0.01	136	136	536	640	17,100	8.86	2,430	464	1,500	577	11,000

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Table 2 - Pore water Analytical Results

						PFAS			Inorganics											
						Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.001	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water						*0.07*													
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water						**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	PW411	6/09/2022	0089_PW411_220906	Normal	EP2211401	<0.01	<0.01	<0.01	126	126	576	590	18,300	1.24	2,740	414	1,330	475	10,300
Helicopter Support Facility	PW413	14/01/2020	0089_PW413_200114	Normal	EP2000432	<0.01	<0.01	<0.01	137	137	631	751	20,100	8.69	2,950	542	1,690	772	13,000
	PW413	1/04/2020	0089_PW413_200401	Normal	EP2003417	<0.01	<0.01	<0.01	297	297	451	484	14,200	3.53	2,120	405	1,090	496	8,300
	PW413	21/07/2020	0089_PW413_200721	Normal	EP2007611	<0.01	<0.01	<0.01	202	202	574	696	18,200	9.64	2,700	615	1,520	717	12,000
	PW413	22/09/2020	0089_PW413_200922	Normal	EP2010143	<0.01	<0.01	<0.01	96	96	604	611	19,400	0.53	2,660	412	1,340	576	10,700
	PW413	15/12/2020	0089_PW413_201215	Normal	EP2014044	<0.01	<0.01	<0.01	125	125	616	720	19,600	7.84	2,900	496	1,590	658	12,600
	PW413	18/03/2021	0089_PW413_210318	Normal	EP2102941	<0.01	<0.01	<0.01	198	198	615	680	19,500	5.09	2,910	501	1,530	638	11,800
	PW413	9/06/2021	0089_PW413_210609	Normal	EP2106519	<0.01	<0.01	<0.01	118	118	587	673	18,800	6.87	2,590	477	1,510	634	11,700
	PW413	1/09/2021	0089_PW413_210901	Normal	EP2110155	<0.01	<0.01	<0.01	113	113	549	621	17,700	6.18	2,280	434	1,400	575	10,800
	PW413	14/01/2022	0089_PW413_220114	Normal	EP2200400	<0.01	<0.01	<0.01	125	125	654	676	21,100	1.63	2,710	472	1,500	607	11,800
	PW413	16/03/2022	0089_PW413_220316	Normal	EP2203058	<0.01	<0.01	<0.01	111	111	631	658	20,100	2.10	2,960	452	1,500	628	11,400
	PW413	7/06/2022	0089_PW413_220607	Normal	EP2206887	<0.01	<0.01	<0.01	128	128	545	605	17,400	5.25	2,480	441	1,420	554	10,400
	PW413	6/09/2022	0089_PW413_220906	Normal	EP2211401	<0.01	<0.01	<0.01	128	128	582	608	18,600	2.18	2,640	435	1,370	492	10,600
Helicopter Support Facility	PW415	14/01/2020	0089_PW415_200114	Normal	EP2000432	<0.01	<0.01	<0.01	128	128	616	739	19,600	9.06	2,930	537	1,660	748	12,800
	PW415	1/04/2020	0089_PW415_200401	Normal	EP2003417	<0.01	<0.01	<0.01	213	213	276	296	8,650	3.44	1,340	274	734	320	4,910
	PW415	21/07/2020	0089_PW415_200721	Normal	EP2007611	<0.01	<0.01	<0.01	148	148	570	669	18,200	7.98	2,600	536	1,460	700	11,600
	PW415	22/09/2020	0089_PW415_200922	Normal	EP2010145	<0.01	<0.01	<0.01	121	121	608	665	19,400	4.51	2,790	484	1,510	648	11,500
	PW415	15/12/2020	0089_PW415_201215	Normal	EP2014044	0.02	0.02	0.02	126	126	619	730	19,700	8.25	2,910	505	1,640	684	12,700
	PW415	18/03/2021	0089_PW415_210318	Normal	EP2102941	<0.01	<0.01	<0.01	143	143	410	402	12,900	0.98	2,080	294	881	392	7,010
	PW415	9/06/2021	0089_PW415_210609	Normal	EP2106519	<0.01	<0.01	<0.01	125	125	579	703	18,500	9.64	2,630	499	1,580	666	12,200
	PW415	1/09/2021	0089_PW415_210901	Normal	EP2110155	<0.01	<0.01	<0.01	116	116	555	638	17,900	6.92	2,310	447	1,430	592	11,100
	PW415	14/01/2022	0089_PW415_220114	Normal	EP2200400	<0.01	<0.01	<0.01	114	114	641	630	20,700	0.85	2,650	436	1,410	558	11,000
	PW415	16/03/2022	0089_PW415_220316	Normal	EP2203058	<0.01	<0.01	<0.01	174	174	535	545	16,900	0.89	2,640	390	1,260	532	9,380
	PW415	7/06/2022	0089_PW415_220607	Normal	EP2206887	<0.01	<0.01	<0.01	142	142	572	617	18,300	3.80	2,540	447	1,450	561	10,600
	PW415	6/09/2022	0089_PW415_220906	Normal	EP2211401	<0.01	<0.01	<0.01	135	135	588	630	18,800	3.51	2,630	446	1,420	507	11,000

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

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Table 3 - Surface Water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*			
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19			
PFAS NEMP 2020 Recreational Water																**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Fire Training Area	SW130	17/07/2017	0089_SW130_170717	Normal	198331	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
	SW130	8/01/2020	0089_SW130_200108	Normal	EP2000180	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	30/03/2020	0089_SW130_200330	Normal	EP2003316	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	15/07/2020	0089_SW130_200715	Normal	EP2007383	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	22/09/2020	0089_SW130_200922	Normal	EP2010153	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	14/12/2020	0089_SW130_201214	Normal	EP2013985	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	0.09	<0.01	<0.02	<0.02	<0.02
	SW130	15/03/2021	0089_SW130_210315	Normal	EP2102756	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	8/06/2021	0089_SW130_210608	Normal	EP2106465	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	30/08/2021	0089_SW130_210830	Normal	EP2110021	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	10/01/2022	0089_SW130_220110	Normal	EP2200215	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	14/03/2022	0089_SW130_220314	Normal	EP2202977	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	7/06/2022	0089_SW130_220607	Normal	EP2206881	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW130	5/09/2022	0089_SW130_220905	Normal	EP2211344	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Fire Training Area	SW132	17/07/2017	0089_QC1SW_170717	Field Duplicate	198331	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
	SW132	17/07/2017	0089_QC2SW_170717	Interlab Duplicate	555139	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW132	17/07/2017	0089_SW132_170717	Normal	198331	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
	SW132	8/01/2020	0089_SW132_200108	Normal	EP2000180	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	30/03/2020	0089_SW132_200330	Normal	EP2003316	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	15/07/2020	0089_QC103_200715	Field Duplicate	EP2007383	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	15/07/2020	0089_QC203_200215	Interlab Duplicate	732844	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW132	15/07/2020	0089_SW132_200715	Normal	EP2007383	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	22/09/2020	0089_SW132_200922	Normal	EP2010153	<0.02	<0.02	0.03	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	14/12/2020	0089_QC107_201214	Field Duplicate	EP2013988	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	14/12/2020	0089_QC207_201114	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW132	14/12/2020	0089_SW132_201214	Normal	EP2013988	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	15/03/2021	0089_SW132_210315	Normal	EP2102756	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	8/06/2021	0089_SW132_210608	Normal	EP2106465	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	30/08/2021	0089_SW132_210830	Normal	EP2110021	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	10/01/2022	0089_SW132_220110	Normal	EP2200215	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	14/03/2022	0089_SW132_220314	Normal	EP2202977	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	7/06/2022	0089_SW132_220607	Normal	EP2206881	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	5/09/2022	0089_QC104_220905	Field Duplicate	EP2211344	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW132	5/09/2022	0089_QC204_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW132	5/09/2022	0089_SW132_220905	Normal	EP2211344	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Fire Training Area	SW134	17/07/2017	0089_SW134_170717	Normal	198331	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
	SW134	8/01/2020	0089_QC109_200108	Field Duplicate	EP2000180	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	8/01/2020	0089_QC209_200108	Interlab Duplicate	696100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW134	8/01/2020	0089_SW134_200108	Normal	EP2000180	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	31/03/2020	0089_QC101_200331	Field Duplicate	EP2003367	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	31/03/2020	0089_QC201_200331	Interlab Duplicate	711434	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW134	31/03/2020	0089_SW134_200331	Normal	EP2003367	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	15/07/2020	0089_SW134_200715	Normal	EP2007383	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	22/09/2020	0089_QC116_200922	Field Duplicate	EP2010153	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	22/09/2020	0089_QC216_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW134	22/09/2020	0089_SW134_200922	Normal	EP2010153	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	14/12/2020	0089_SW134_201214	Normal	EP2013988	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	15/03/2021	0089_SW134_210315	Normal	EP2102756	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	8/06/2021	0089_QC110_210608	Field Duplicate	EP2106450	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	8/06/2021	0089_QC210_210608	Interlab Duplicate	802464	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW134	8/06/2021	0089_SW134_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	30/08/2021	0089_QC104_210830	Field Duplicate	EP2110021	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	30/08/2021	0089_QC204_210830	Interlab Duplicate	820919	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW134	30/08/2021	0089_SW134_210830	Normal	EP2110021	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	10/01/2022	0089_QC102_220110	Field Duplicate	EP2200212	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	10/01/2022	0089_QC202_220110	Interlab Duplicate	854607	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Table 3 - Surface Water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*			
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19			
PFAS NEMP 2020 Recreational Water																**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	SW134	10/01/2022	0089_SW134_220110	Normal	EP2200212	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	14/03/2022	0089_QC107_220314	Field Duplicate	EP2202977	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	14/03/2022	0089_QC207_220314	Interlab Duplicate	872911	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW134	14/03/2022	0089_SW134_220314	Normal	EP2202977	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	7/06/2022	0089_QC108_220607	Field Duplicate	EP2206881	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	7/06/2022	0089_QC208_220607	Interlab Duplicate	896805	<0.002	<0.002	0.003	<0.002	0.027	<0.004	<0.008	<0.002	0.002	<0.004	<0.001	<0.002	<0.001	<0.001
	SW134	7/06/2022	0089_SW134_220607	Normal	EP2206881	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW134	5/09/2022	0089_SW134_220905	Normal	EP2211344	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	24/08/2017	0089_SW150_170824	Normal	199846	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW150	8/01/2020	0089_SW150_200108	Normal	EP2000180	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	30/03/2020	0089_SW150_200330	Normal	EP2003309	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	20/07/2020	0089_SW150_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	23/09/2020	0089_SW150_200923	Normal	EP2010218	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	14/12/2020	0089_SW150_201214	Normal	EP2013973	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	16/03/2021	0089_SW150_210316	Normal	EP2102836	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	8/06/2021	0089_QC109_210608	Field Duplicate	EP2106465	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	8/06/2021	0089_QC209_210608	Interlab Duplicate	802464	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition ground	SW150	8/06/2021	0089_SW150_210608	Normal	EP2106465	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	30/08/2021	0089_SW150_210830	Field Duplicate	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	30/08/2021	0089_QC208_210830	Interlab Duplicate	820919	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW150	30/08/2021	0089_SW150_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	10/01/2022	0089_SW150_220110	Normal	EP2200218	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	15/03/2022	0089_QC117_220315	Field Duplicate	EP2203019	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	15/03/2022	0089_QC217_220315	Interlab Duplicate	872903	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW150	15/03/2022	0089_SW150_220315	Normal	EP2203019	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	8/06/2022	0089_SW150_220608	Normal	EP2206970	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW150	5/09/2022	0089_SW150_220905	Normal	EP2211347	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	24/08/2017	0089_SW152_170824	Normal	199846	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW152	8/01/2020	0089_SW152_200108	Normal	EP2000180	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	30/03/2020	0089_SW152_200330	Normal	EP2003309	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	20/07/2020	0089_SW152_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	23/09/2020	0089_SW152_200923	Normal	EP2010218	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	14/12/2020	0089_SW152_201214	Normal	EP2013973	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	16/03/2021	0089_SW152_210316	Normal	EP2102836	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Demolition ground	SW152	8/06/2021	0089_SW152_210608	Normal	EP2106465	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	30/08/2021	0089_SW152_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	10/01/2022	0089_SW152_220110	Normal	EP2200218	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	15/03/2022	0089_SW152_220315	Normal	EP2203019	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	8/06/2022	0089_SW152_220608	Normal	EP2206970	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	5/09/2022	0089_QC103_220905	Field Duplicate	EP2211347	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW152	5/09/2022	0089_QC203_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW152	5/09/2022	0089_SW152_220905	Normal	EP2211347	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	24/08/2017	0089_SW154_170824	Normal	199846	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW154	8/01/2020	0089_QC104_200108	Field Duplicate	EP2000180	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	8/01/2020	0089_QC204_200108	Interlab Duplicate	696100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW154	8/01/2020	0089_SW154_200108	Normal	EP2000180	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	30/03/2020	0089_SW154_200330	Normal	EP2003309	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	20/07/2020	0089_SW154_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	22/09/2020	0089_SW154_200922	Normal	EP2010153	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	14/12/2020	0089_SW154_201214	Normal	EP2013989	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Demolition ground	SW154	16/03/2021	0089_SW154_210316	Normal	EP2102836	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	8/06/2021	0089_SW154_210608	Normal	EP2106465	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	30/08/2021	0089_SW154_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	10/01/2022	0089_SW154_220110	Normal	EP2200218	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	15/03/2022	0089_QC113_220315	Field Duplicate	EP2203019	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	15/03/2022	0089_QC213_220315	Interlab Duplicate	872903	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW154	15/03/2022	0089_SW154_220315	Normal	EP2203019	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 3 - Surface Water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*			
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19			
PFAS NEMP 2020 Recreational Water																**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	SW154	8/06/2022	0089_SW154_220608	Normal	EP2206970	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW154	5/09/2022	0089_SW154_220905	Normal	EP2211347	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Demolition ground	SW156	24/08/2017	0089_SW156_170824	Normal	199846	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW156	8/01/2020	0089_SW156_200108	Normal	EP2000180	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	30/03/2020	0089_SW156_200330	Normal	EP2003309	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	20/07/2020	0089_SW156_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	23/09/2020	0089_SW156_200923	Normal	EP2010218	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	14/12/2020	0089_SW156_201214	Normal	EP2013989	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	16/03/2021	0089_QC111_210316	Field Duplicate	EP2102836	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	16/03/2021	0089_QC211_210316	Interlab Duplicate	781350	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW156	16/03/2021	0089_SW156_210316	Normal	EP2102836	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	8/06/2021	0089_SW156_210608	Normal	EP2106465	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	30/08/2021	0089_SW156_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	10/01/2022	0089_QC107_220110	Field Duplicate	EP2200218	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	10/01/2022	0089_QC207_220110	Interlab Duplicate	854607	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW156	10/01/2022	0089_SW156_220110	Normal	EP2200218	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	15/03/2022	0089_SW156_220315	Normal	EP2203019	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	8/06/2022	0089_SW156_220608	Normal	EP2206970	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW156	5/09/2022	0089_SW156_220905	Normal	EP2211347	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste Water Treatment Plan	SW305	17/04/2018	0089_SW305_180417	Normal	209522	<0.001	<0.001	0.003	<0.001	0.008	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW305	8/01/2020	0089_SW305_200108	Normal	EP2000183	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	31/03/2020	0089_SW305_200331	Normal	EP2003372	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	20/07/2020	0089_SW305_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	22/09/2020	0089_SW305_200922	Normal	EP2010145	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	15/12/2020	0089_SW305_201215	Normal	EP2014048	<0.02	<0.02	<0.02	<0.02	0.13	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	15/03/2021	0089_SW305_210315	Normal	EP2102758	<0.02	<0.02	0.03	<0.02	0.37	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	10/06/2021	0089_SW305_210610	Normal	EP2106582	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	1/09/2021	0089_SW305_210901	Normal	EP2110154	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	11/01/2022	0089_SW305_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	18/03/2022	0089_SW305_220318	Normal	EP2203195	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	8/06/2022	0089_SW305_220608	Normal	EP2206973	<0.02	<0.02	0.01	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	5/09/2022	0089_QC115_220905	Field Duplicate	EP2211344	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW305	5/09/2022	0089_QC215_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW305	5/09/2022	0089_SW305_220905	Normal	EP2211344	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	SW309	18/04/2018	0089_SW309_180418	Normal	209573	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW309	10/01/2020	0089_QC101_200110	Field Duplicate	EP2000292	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	10/01/2020	0089_QC201_200110	Interlab Duplicate	696578	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW309	10/01/2020	0089_SW309_200110	Normal	EP2000292	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	31/03/2020	0089_SW309_200331	Normal	EP2003369	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	22/07/2020	0089_SW309_200722	Normal	EP2007649	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	23/09/2020	0089_SW309_200923	Normal	EP2010222	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	15/12/2020	0089_QC112_201215	Field Duplicate	EP2014048	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	15/12/2020	0089_QC212_201115	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW309	15/12/2020	0089_SW309_201215	Normal	EP2014048	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	17/03/2021	0089_SW309_210317	Normal	EP2102892	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	9/06/2021	0089_SW309_210609	Normal	EP2106519	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	31/08/2021	0089_QC114_210831	Field Duplicate	EP2110065	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	31/08/2021	0089_QC214_210831	Interlab Duplicate	821197	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW309	31/08/2021	0089_SW309_210831	Normal	EP2110065	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	13/01/2022	0089_SW309_220113	Normal	EP2200338	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	16/03/2022	0089_SW309_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	7/06/2022	0089_SW309_220607	Normal	EP2206887	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW309	6/09/2022	0089_SW309_220906	Normal	EP2211401	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	30/04/2018	0089_SW310_180430	Normal	209959	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW310	10/01/2020	0089_SW310_200110	Normal	EP2000292	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	31/03/2020	0089_SW310_200331	Normal	EP2003369	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	22/07/2020	0089_SW310_200722	Normal	EP2007649	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 3 - Surface Water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
Helicopter Support Facility	SW310	23/09/2020	0089_SW310_200923	Normal	EP2010222		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	15/12/2020	0089_SW310_201215	Normal	EP2014048		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	17/03/2021	0089_SW310_210317	Normal	EP2102890		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	9/06/2021	0089_SW310_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	31/08/2021	0089_SW310_210831	Normal	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	13/01/2022	0089_SW310_220113	Normal	EP2200338		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	16/03/2022	0089_SW310_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	7/06/2022	0089_QC103_220607	Field Duplicate	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	7/06/2022	0089_QC203_220607	Interlab Duplicate	896805		<0.002	<0.002	<0.002	<0.002	0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001
	SW310	7/06/2022	0089_SW310_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW310	6/09/2022	0089_SW310_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	SW311	30/04/2018	0089_SW311_180430	Normal	209959		<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW311	1/04/2020	0089_SW311_200401	Normal	EP2003418		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	22/07/2020	0089_SW311_200722	Normal	EP2007649		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	23/09/2020	0089_SW311_200923	Normal	EP2010222		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	15/12/2020	0089_SW311_201215	Normal	EP2014053		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	17/03/2021	0089_SW311_210317	Normal	EP2102892		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	9/06/2021	0089_SW311_210609	Normal	EP2106519		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	31/08/2021	0089_SW311_210831	Normal	EP2110072		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	13/01/2022	0089_SW311_220113	Normal	EP2200338		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	16/03/2022	0089_SW311_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	7/06/2022	0089_SW311_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW311	6/09/2022	0089_SW311_220906	Normal	EP2211401		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Dredge spoil and Careening bay	SW317	17/04/2018	0089_SW317_180417	Normal	209522		<0.001	<0.001	0.001	<0.001	0.007	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW317	8/01/2020	0089_SW317_200108	Normal	EP2000183		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	10/01/2020	0089_SW317_200110	Normal	EP2000292		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	30/03/2020	0089_SW317_200330	Normal	EP2003314		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	21/07/2020	0089_SW317_200721	Normal	EP2007604		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	21/09/2020	0089_SW317_200921	Normal	EP2010083		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	14/12/2020	0089_SW317_201214	Normal	EP2013989		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	15/03/2021	0089_SW317_210315	Normal	EP2102758		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	10/06/2021	0089_SW317_210610	Normal	EP2106582		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	31/08/2021	0089_SW317_210831	Normal	EP2110068		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	13/01/2022	0089_SW317_220113	Normal	EP2200343		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	16/03/2022	0089_SW317_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	9/06/2022	0089_SW317_220609	Normal	EP2207029		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW317	6/09/2022	0089_SW317_220906	Normal	EP2211391		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Dredge spoil and Careening bay	SW318	18/04/2018	0089_SW318_180418	Normal	209573		<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW318	8/01/2020	0089_SW318_200108	Normal	EP2000183		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	30/03/2020	0089_QC103_200330	Field Duplicate	EP2003314		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	30/03/2020	0089_QC203_200330	Interlab Duplicate	711144		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW318	30/03/2020	0089_SW318_200330	Normal	EP2003314		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	21/07/2020	0089_SW318_200721	Normal	EP2007604		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	21/09/2020	0089_SW318_200921	Normal	EP2010083		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	14/12/2020	0089_SW318_201214	Normal	EP2013989		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	15/03/2021	0089_SW318_210315	Normal	EP2102758		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	10/06/2021	0089_SW318_210610	Normal	EP2106582		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	31/08/2021	0089_SW318_210831	Normal	EP2110068		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	13/01/2022	0089_SW318_220113	Normal	EP2200343		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	16/03/2022	0089_SW318_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	9/06/2022	0089_SW318_220609	Normal	EP2207029		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW318	6/09/2022	0089_SW318_220906	Normal	EP2211391		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	18/04/2018	0089_SW319_180418	Normal	209573		<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW319	8/01/2020	0089_SW319_200108	Normal	EP2000183		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	30/03/2020	0089_QC104_200330	Field Duplicate	EP2003314		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	30/03/2020	0089_QC204_200330	Interlab Duplicate	711144		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW319	30/03/2020	0089_SW319_200330	Normal	EP2003314		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 3 - Surface Water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
Dredge spoil and Careening bay	SW319	21/07/2020	0089_SW319_200721	Normal	EP2007604		<0.02	<0.02	0.03	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	21/09/2020	0089_QC104_200921	Field Duplicate	EP2010083		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	21/09/2020	0089_QC204_200921	Interlab Duplicate	746269		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW319	21/09/2020	0089_SW319_200921	Normal	EP2010083		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	14/12/2020	0089_QC111_201214	Field Duplicate	EP2013989		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	14/12/2020	0089_QC211_201114	Interlab Duplicate	765054		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW319	14/12/2020	0089_SW319_201214	Normal	EP2013989		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	15/03/2021	0089_QC107_210315	Field Duplicate	EP2102758		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	15/03/2021	0089_QC207_210315	Interlab Duplicate	781350		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW319	15/03/2021	0089_SW319_210315	Normal	EP2102758		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	10/06/2021	0089_SW319_210610	Normal	EP2106582		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	31/08/2021	0089_SW319_210831	Normal	EP2110068		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	13/01/2022	0089_SW319_220113	Normal	EP2200343		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	16/03/2022	0089_SW319_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	9/06/2022	0089_SW319_220609	Normal	EP2207029		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW319	6/09/2022	0089_SW319_220906	Normal	EP2211391		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste Water Treatment Plant	SW353	19/04/2018	0089_SW353_180419	Normal	209623		<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW353	30/01/2020	0089_SW353_200130	Normal	EP2001004		<0.02	<0.02	<0.02	<0.02	0.52	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02
	SW353	2/04/2020	0089_SW353_200402	Normal	EP2003473		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	21/07/2020	0089_SW353_200721	Normal	EP2007595		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	23/09/2020	0089_SW353_200923	Normal	EP2010222		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	16/12/2020	0089_SW353_201216	Normal	EP2014090		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	17/03/2021	0089_SW353_210317	Normal	EP2102901		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	8/06/2021	0089_SW353_210608	Normal	EP2106450		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	30/08/2021	0089_SW353_210830	Normal	EP2110017		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	11/01/2022	0089_SW353_220111	Normal	EP2200240		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	14/03/2022	0089_SW353_220314	Normal	EP2202980		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	7/06/2022	0089_SW353_220607	Normal	EP2206884		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW353	7/09/2022	0089_SW353_220907	Normal	EP2211496		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste Water Treatment Plant	SW370	17/04/2018	0089_SW370_180417	Normal	209522		<0.001	<0.001	0.003	<0.001	0.008	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW370	9/01/2020	0089_SW370_200109	Normal	EP2000249		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	0.03	<0.01	<0.02	<0.02	<0.02
	SW370	31/03/2020	0089_SW370_200331	Normal	EP2003372		<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	15/07/2020	0089_SW370_200715	Normal	EP2007383		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	24/09/2020	0089_SW370_200924	Normal	EP2010274		<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	15/12/2020	0089_SW370_201215	Normal	EP2014053		<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	16/03/2021	0089_SW370_210316	Normal	EP2102834		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	9/06/2021	0089_SW370_210609	Normal	EP2106517		<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	1/09/2021	0089_SW370_210901	Normal	EP2110154		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	10/01/2022	0089_SW370_220110	Normal	EP2200215		<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	14/03/2022	0089_SW370_220314	Normal	EP2202977		<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	7/06/2022	0089_SW370_220607	Normal	EP2206884		<0.02	<0.02	0.02	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW370	5/09/2022	0089_SW370_220905	Normal	EP2211341		<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste Water Treatment Plant	SW371	17/04/2018	0089_SW371_180417	Normal	209522		<0.001	<0.001	0.003	<0.001	0.009	<0.002	<0.002	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW371	8/01/2020	0089_SW371_200108	Normal	EP2000183		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	1/04/2020	0089_SW371_200401	Normal	EP2003414		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	20/07/2020	0089_SW371_200720	Normal	EP2007545		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	22/09/2020	0089_SW371_200922	Normal	EP2010145		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	15/12/2020	0089_SW371_201215	Normal	EP2014048		<0.02	<0.02	<0.02	<0.02	0.31	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	15/03/2021	0089_QC103_210315	Field Duplicate	EP2102758		<0.02	<0.02	0.02	<0.02	0.24	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	15/03/2021	0089_QC203_210315	Interlab Duplicate	781350		<0.01	<0.01	0.02	<0.01	0.10	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW371	15/03/2021	0089_SW371_210315	Normal	EP2102758		<0.02	<0.02	0.02	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	10/06/2021	0089_SW371_210610	Normal	EP2106590		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	1/09/2021	0089_SW371_210901	Normal	EP2110154		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	11/01/2022	0089_SW371_220111	Normal	EP2200240		<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	18/03/2022	0089_SW371_220318	Normal	EP2203195		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	8/06/2022	0089_SW371_220608	Normal	EP2206973		<0.02	<0.02	0.02	<0.02	0.18	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW371	5/09/2022	0089_SW371_220905	Normal	EP2211344		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 3 - Surface Water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*			
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19			
PFAS NEMP 2020 Recreational Water																**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Waste Water Treatment Plant	SW372	13/04/2018	0089_SW372_180413	Normal	209417	0.002	0.003	0.017	0.002	0.042	<0.002	<0.002	<0.002	0.006	<0.001	0.002	<0.001	<0.002	<0.002
	SW372	8/01/2020	0089_SW372_200108	Normal	EP2000183	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	31/03/2020	0089_SW372_200331	Normal	EP2003372	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	20/07/2020	0089_SW372_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	22/09/2020	0089_SW372_200922	Normal	EP2010145	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	15/12/2020	0089_SW372_201215	Normal	EP2014044	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	17/03/2021	0089_SW372_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	10/06/2021	0089_SW372_210610	Normal	EP2106590	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	1/09/2021	0089_SW372_210901	Normal	EP2110154	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	12/01/2022	0089_QC116_220112	Field Duplicate	EP2200289	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	12/01/2022	0089_QC216_220112	Interlab Duplicate	855202	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW372	12/01/2022	0089_SW372_220112	Normal	EP2200289	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	18/03/2022	0089_SW372_220318	Normal	EP2203195	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	8/06/2022	0089_SW372_220608	Normal	EP2206973	<0.02	<0.02	0.02	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW372	6/09/2022	0089_SW372_220906	Normal	EP2211391	<0.02	<0.02	0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste Water Treatment Plant	SW373	13/04/2018	0089_SW373_180413	Normal	209417	0.002	0.002	0.020	0.002	0.042	<0.002	<0.002	<0.002	0.005	<0.001	0.001	<0.001	<0.002	<0.002
	SW373	8/01/2020	0089_SW373_200108	Normal	EP2000183	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	31/03/2020	0089_SW373_200331	Normal	EP2003372	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	20/07/2020	0089_SW373_200720	Normal	EP2007545	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	22/09/2020	0089_SW373_200922	Normal	EP2010145	<0.02	<0.02	0.12	<0.02	0.44	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02
	SW373	15/12/2020	0089_SW373_201215	Normal	EP2014044	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	17/03/2021	0089_SW373_210317	Normal	EP2102901	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	10/06/2021	0089_MW373_210610	Normal	EP2106579	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	30/08/2021	0089_SW373_210830	Normal	EP2110017	<0.02	<0.02	0.03	<0.02	0.37	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	12/01/2022	0089_SW373_220112	Normal	EP2200289	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	18/03/2022	0089_SW373_220318	Normal	EP2203195	<0.02	<0.02	0.02	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	8/06/2022	0089_SW373_220608	Normal	EP2206973	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW373	6/09/2022	0089_SW373_220906	Normal	EP2211391	<0.02	<0.02	0.01	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste Water Treatment Plant	SW382	19/04/2018	0089_SW382_180419	Normal	209623	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW382	30/01/2020	0089_SW382_200130	Normal	EP2001004	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	2/04/2020	0089_SW382_200402	Normal	EP2003473	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	21/07/2020	0089_SW382_200721	Normal	EP2007595	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	23/09/2020	0089_SW382_200923	Normal	EP2010218	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	16/12/2020	0089_SW382_201216	Normal	EP2014104	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	17/03/2021	0089_SW382_210317	Normal	EP2102892	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	8/06/2021	0089_SW382_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	30/08/2021	0089_SW382_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	0.17	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	11/01/2022	0089_SW382_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	14/03/2022	0089_SW382_220314	Normal	EP2202980	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	7/06/2022	0089_SW382_220607	Normal	EP2206881	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW382	7/09/2022	0089_SW382_220907	Normal	EP2211496	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Waste Water Treatment Plant	SW383	19/04/2018	0089_SW383_180419	Normal	209623	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW383	30/01/2020	0089_SW383_200130	Normal	EP2001004	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	2/04/2020	0089_SW383_200402	Normal	EP2003473	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	21/07/2020	0089_SW383_200721	Normal	EP2007595	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	23/09/2020	0089_SW383_200923	Normal	EP2010222	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	16/12/2020	0089_SW383_201216	Normal	EP2014090	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	17/03/2021	0089_SW383_210317	Normal	EP2102892	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	8/06/2021	0089_SW383_210608	Normal	EP2106450	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	30/08/2021	0089_SW383_210830	Normal	EP2110017	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	11/01/2022	0089_SW383_220111	Normal	EP2200240	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	7/06/2022	0089_SW383_220607	Normal	EP2206884	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW383	7/09/2022	0089_SW383_220907	Normal	EP2211496	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	19/04/2018	0089_SW384_180419	Normal	209623	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
	SW384	30/01/2020	0089_SW384_200130	Normal	EP2001004	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	2/04/2020	0089_SW384_200402	Normal	EP2003473	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	21/07/2020	0089_SW384_200721	Normal	EP2007595	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 3 - Surface Water Analytical Results

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting							0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																	*0.56*			
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19			
PFAS NEMP 2020 Recreational Water																	**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
Waste Water Treatment Plant	SW384	23/09/2020	0089_SW384_200923	Normal	EP2010222		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	16/12/2020	0089_SW384_201216	Normal	EP2014090		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	17/03/2021	0089_SW384_210317	Normal	EP2102901		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	8/06/2021	0089_SW384_210608	Normal	EP2106450		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	30/08/2021	0089_SW384_210830	Normal	EP2110017		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	11/01/2022	0089_SW384_220111	Normal	EP2200240		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	14/03/2022	0089_SW384_220314	Normal	EP2202980		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	7/06/2022	0089_SW384_220607	Normal	EP2206884		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW384	7/09/2022	0089_SW384_220907	Normal	EP2211496		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	SW406	14/01/2020	0089_SW406_200114	Normal	EP2000422		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	1/04/2020	0089_SW406_200401	Normal	EP2003420		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	22/07/2020	0089_QC113_200722	Field Duplicate	EP2007649		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	22/07/2020	0089_QC213_200722	Interlab Duplicate	734409		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW406	22/07/2020	0089_SW406_200722	Normal	EP2007649		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	21/09/2020	0089_QC111_200921	Field Duplicate	EP2010083		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	21/09/2020	0089_QC211_200921	Interlab Duplicate	746269		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW406	21/09/2020	0089_SW406_200921	Normal	EP2010083		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	15/12/2020	0089_SW406_201215	Normal	EP2014048		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	15/03/2021	0089_SW406_210315	Normal	EP2102756		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	10/06/2021	0089_SW406_210610	Normal	EP2106590		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	31/08/2021	0089_SW406_210831	Normal	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	0.08	0.08	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	14/01/2022	0089_SW406_220114	Normal	EP2200400		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	16/03/2022	0089_SW406_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	7/06/2022	0089_SW406_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW406	7/09/2022	0089_SW406_220907	Normal	EP2211496		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	SW408	14/01/2020	0089_SW408_200114	Normal	EP2000422		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	1/04/2020	0089_SW408_200401	Normal	EP2003420		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	22/07/2020	0089_SW408_200722	Normal	EP2007649		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	21/09/2020	0089_SW408_200921	Normal	EP2010083		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	15/12/2020	0089_SW408_201215	Normal	EP2014053		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	15/03/2021	0089_SW408_210315	Normal	EP2102756		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	10/06/2021	0089_SW408_210610	Normal	EP2106590		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	31/08/2021	0089_SW408_210831	Normal	EP2110072		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	0.03	0.03	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	14/01/2022	0089_SW408_220114	Normal	EP2200400		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	16/03/2022	0089_SW408_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	7/06/2022	0089_SW408_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW408	7/09/2022	0089_SW408_220907	Normal	EP2211498		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	SW410	14/01/2020	0089_SW410_200114	Normal	EP2000422		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	2/04/2020	0089_SW410_200402	Normal	EP2003471		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	21/07/2020	0089_SW410_200721	Normal	EP2007604		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	22/09/2020	0089_SW410_200922	Normal	EP2010145		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	15/12/2020	0089_SW410_201215	Normal	EP2014044		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	17/03/2021	0089_SW410_210317	Normal	EP2102901		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	10/06/2021	0089_QC114_210610	Field Duplicate	EP2106590		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	10/06/2021	0089_QC214_210610	Interlab Duplicate	802734		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW410	10/06/2021	0089_SW410_210610	Normal	EP2106590		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	31/08/2021	0089_SW410_210831	Normal	EP2110065		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	14/01/2022	0089_SW410_220114	Normal	EP2200400		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	16/03/2022	0089_SW410_220316	Normal	EP2203058		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	7/06/2022	0089_SW410_220607	Normal	EP2206887		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW410	6/09/2022	0089_SW410_220906	Normal	EP2211391		<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	SW412	14/01/2020	0089_SW412_200114	Normal	EP2000422		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	1/04/2020	0089_SW412_200401	Normal	EP2003418		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	21/07/2020	0089_SW412_200721	Normal	EP2007604		<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	22/09/2020	0089_SW412_200922	Normal	EP2010145		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	15/12/2020	0089_SW412_201215	Normal	EP2014044		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	18/03/2021	0089_SW412_210318	Normal	EP2102956		<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

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Table 3 - Surface Water Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Drinking Water																*0.56*			
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19			
PFAS NEMP 2020 Recreational Water																**10**			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Helicopter Support Facility	SW412	9/06/2021	0089_SW412_210609	Normal	EP2106517	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	1/09/2021	0089_SW412_210901	Normal	EP2110155	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	14/01/2022	0089_SW412_220114	Normal	EP2200400	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	16/03/2022	0089_SW412_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	7/06/2022	0089_SW412_220607	Normal	EP2206887	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW412	6/09/2022	0089_SW412_220906	Normal	EP2211401	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	SW414	14/01/2020	0089_SW414_200114	Normal	EP2000422	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	2/04/2020	0089_SW414_200402	Normal	EP2003473	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	21/07/2020	0089_SW414_200721	Normal	EP2007604	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	22/09/2020	0089_SW414_200922	Normal	EP2010145	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	15/12/2020	0089_SW414_201215	Normal	EP2014044	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	18/03/2021	0089_SW414_210318	Normal	EP2102941	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	9/06/2021	0089_SW414_210609	Normal	EP2106517	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	1/09/2021	0089_SW414_210901	Normal	EP2110155	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	14/01/2022	0089_SW414_220114	Normal	EP2200400	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	16/03/2022	0089_SW414_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	7/06/2022	0089_QC116_220607	Field Duplicate	EP2206887	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	7/06/2022	0089_QC216_220607	Interlab Duplicate	896805	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001
	SW414	7/06/2022	0089_SW414_220607	Normal	EP2206887	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW414	6/09/2022	0089_SW414_220906	Normal	EP2211401	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
Helicopter Support Facility	SW416	14/01/2020	0089_SW416_200114	Normal	EP2000422	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	2/04/2020	0089_SW416_200402	Normal	EP2003473	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	21/07/2020	0089_SW416_200721	Normal	EP2007604	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	22/09/2020	0089_SW416_200922	Normal	EP2010145	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	15/12/2020	0089_SW416_201215	Normal	EP2014044	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	18/03/2021	0089_SW416_210318	Normal	EP2102941	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	9/06/2021	0089_SW416_210609	Normal	EP2106517	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	1/09/2021	0089_SW416_210901	Normal	EP2110155	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	14/01/2022	0089_SW416_220114	Normal	EP2200400	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	16/03/2022	0089_SW416_220316	Normal	EP2203058	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	7/06/2022	0089_SW416_220607	Normal	EP2206887	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02
	SW416	6/09/2022	0089_SW416_220906	Normal	EP2211401	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

Cardno now Stantec

Table 3 - Surface Water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
						Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008
PFAS NEMP 2020 Drinking Water																			
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Fire Training Area	SW130	17/07/2017	0089_SW130_170717	Normal	198331	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5
	SW130	8/01/2020	0089_SW130_200108	Normal	EP2000180	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	30/03/2020	0089_SW130_200330	Normal	EP2003316	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	15/07/2020	0089_SW130_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	22/09/2020	0089_SW130_200922	Normal	EP2010153	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	14/12/2020	0089_SW130_201214	Normal	EP2013985	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	15/03/2021	0089_SW130_210315	Normal	EP2102756	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	8/06/2021	0089_SW130_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	30/08/2021	0089_SW130_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	10/01/2022	0089_SW130_220110	Normal	EP2200215	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	14/03/2022	0089_SW130_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	7/06/2022	0089_SW130_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW130	5/09/2022	0089_SW130_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Fire Training Area	SW132	17/07/2017	0089_QC1SW_170717	Field Duplicate	198331	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5
	SW132	17/07/2017	0089_QC2SW_170717	Interlab Duplicate	555139	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW132	17/07/2017	0089_SW132_170717	Normal	198331	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5
	SW132	8/01/2020	0089_SW132_200108	Normal	EP2000180	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	30/03/2020	0089_SW132_200330	Normal	EP2003316	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	15/07/2020	0089_QC103_200715	Field Duplicate	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	15/07/2020	0089_QC203_200215	Interlab Duplicate	732844	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW132	15/07/2020	0089_SW132_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	22/09/2020	0089_SW132_200922	Normal	EP2010153	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	14/12/2020	0089_QC107_201214	Field Duplicate	EP2013988	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	14/12/2020	0089_QC207_201114	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	0.09	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW132	14/12/2020	0089_SW132_201214	Normal	EP2013988	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	15/03/2021	0089_SW132_210315	Normal	EP2102756	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	8/06/2021	0089_SW132_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	30/08/2021	0089_SW132_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	10/01/2022	0089_SW132_220110	Normal	EP2200215	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	14/03/2022	0089_SW132_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	7/06/2022	0089_SW132_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	5/09/2022	0089_QC104_220905	Field Duplicate	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW132	5/09/2022	0089_QC204_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW132	5/09/2022	0089_SW132_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Fire Training Area	SW134	17/07/2017	0089_SW134_170717	Normal	198331	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5
	SW134	8/01/2020	0089_QC109_200108	Field Duplicate	EP2000180	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	8/01/2020	0089_QC209_200108	Interlab Duplicate	696100	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW134	8/01/2020	0089_SW134_200108	Normal	EP2000180	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	31/03/2020	0089_QC101_200331	Field Duplicate	EP2003367	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	31/03/2020	0089_QC201_200331	Interlab Duplicate	711434	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW134	31/03/2020	0089_SW134_200331	Normal	EP2003367	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	15/07/2020	0089_SW134_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	22/09/2020	0089_QC116_200922	Field Duplicate	EP2010153	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	22/09/2020	0089_QC216_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW134	22/09/2020	0089_SW134_200922	Normal	EP2010153	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	14/12/2020	0089_SW134_201214	Normal	EP2013988	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	15/03/2021	0089_SW134_210315	Normal	EP2102756	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	8/06/2021	0089_QC110_210608	Field Duplicate	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	8/06/2021	0089_QC210_210608	Interlab Duplicate	802464	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW134	8/06/2021	0089_SW134_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	30/08/2021	0089_QC104_210830	Field Duplicate	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	30/08/2021	0089_QC204_210830	Interlab Duplicate	820919	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW134	30/08/2021	0089_SW134_210830	Normal	EP2110021	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	10/01/2022	0089_QC102_220110	Field Duplicate	EP2200212	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	10/01/2022	0089_QC202_220110	Interlab Duplicate	854607	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Table 3 - Surface Water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	SW134	10/01/2022	0089_SW134_220110	Normal	EP2200212	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	14/03/2022	0089_QC107_220314	Field Duplicate	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	14/03/2022	0089_QC207_220314	Interlab Duplicate	872911	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW134	14/03/2022	0089_SW134_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	7/06/2022	0089_QC108_220607	Field Duplicate	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	7/06/2022	0089_QC208_220607	Interlab Duplicate	896805	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008
	SW134	7/06/2022	0089_SW134_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW134	5/09/2022	0089_SW134_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	24/08/2017	0089_SW150_170824	Normal	199846	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW150	8/01/2020	0089_SW150_200108	Normal	EP2000180	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	30/03/2020	0089_SW150_200330	Normal	EP2003309	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	20/07/2020	0089_SW150_200720	Normal	EP2007545	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	23/09/2020	0089_SW150_200923	Normal	EP2010218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	14/12/2020	0089_SW150_201214	Normal	EP2013973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	16/03/2021	0089_SW150_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	8/06/2021	0089_QC109_210608	Field Duplicate	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	8/06/2021	0089_QC209_210608	Interlab Duplicate	802464	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demolition ground	SW150	8/06/2021	0089_SW150_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	30/08/2021	0089_SW150_210830	Field Duplicate	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	30/08/2021	0089_QC208_210830	Interlab Duplicate	820919	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW150	30/08/2021	0089_SW150_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	10/01/2022	0089_SW150_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	15/03/2022	0089_QC117_220315	Field Duplicate	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	15/03/2022	0089_QC217_220315	Interlab Duplicate	872903	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW150	15/03/2022	0089_SW150_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	8/06/2022	0089_SW150_220608	Normal	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW150	5/09/2022	0089_SW150_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	24/08/2017	0089_SW152_170824	Normal	199846	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW152	8/01/2020	0089_SW152_200108	Normal	EP2000180	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	30/03/2020	0089_SW152_200330	Normal	EP2003309	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	20/07/2020	0089_SW152_200720	Normal	EP2007545	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	23/09/2020	0089_SW152_200923	Normal	EP2010218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	14/12/2020	0089_SW152_201214	Normal	EP2013973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	16/03/2021	0089_SW152_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition ground	SW152	8/06/2021	0089_SW152_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	30/08/2021	0089_SW152_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	10/01/2022	0089_SW152_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	15/03/2022	0089_SW152_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	8/06/2022	0089_SW152_220608	Normal	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	5/09/2022	0089_QC103_220905	Field Duplicate	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW152	5/09/2022	0089_QC203_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW152	5/09/2022	0089_SW152_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	24/08/2017	0089_SW154_170824	Normal	199846	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW154	8/01/2020	0089_QC104_200108	Field Duplicate	EP2000180	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	8/01/2020	0089_QC204_200108	Interlab Duplicate	696100	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW154	8/01/2020	0089_SW154_200108	Normal	EP2000180	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	30/03/2020	0089_SW154_200330	Normal	EP2003309	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	20/07/2020	0089_SW154_200720	Normal	EP2007545	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	22/09/2020	0089_SW154_200922	Normal	EP2010153	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	14/12/2020	0089_SW154_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition ground	SW154	16/03/2021	0089_SW154_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	8/06/2021	0089_SW154_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	30/08/2021	0089_SW154_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	10/01/2022	0089_SW154_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	15/03/2022	0089_QC113_220315	Field Duplicate	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	15/03/2022	0089_QC213_220315	Interlab Duplicate	872903	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW154	15/03/2022	0089_SW154_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 3 - Surface Water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
	SW154	8/06/2022	0089_SW154_220608	Normal	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW154	5/09/2022	0089_SW154_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Demolition ground	SW156	24/08/2017	0089_SW156_170824	Normal	199846	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW156	8/01/2020	0089_SW156_200108	Normal	EP2000180	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	30/03/2020	0089_SW156_200330	Normal	EP2003309	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	20/07/2020	0089_SW156_200720	Normal	EP2007545	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	23/09/2020	0089_SW156_200923	Normal	EP2010218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	14/12/2020	0089_SW156_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	16/03/2021	0089_QC111_210316	Field Duplicate	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	16/03/2021	0089_QC211_210316	Interlab Duplicate	781350	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW156	16/03/2021	0089_SW156_210316	Normal	EP2102836	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	8/06/2021	0089_SW156_210608	Normal	EP2106465	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	30/08/2021	0089_SW156_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	10/01/2022	0089_QC107_220110	Field Duplicate	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	10/01/2022	0089_QC207_220110	Interlab Duplicate	854607	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW156	10/01/2022	0089_SW156_220110	Normal	EP2200218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	15/03/2022	0089_SW156_220315	Normal	EP2203019	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	8/06/2022	0089_SW156_220608	Normal	EP2206970	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW156	5/09/2022	0089_SW156_220905	Normal	EP2211347	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste Water Treatment Plan	SW305	17/04/2018	0089_SW305_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW305	8/01/2020	0089_SW305_200108	Normal	EP2000183	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	31/03/2020	0089_SW305_200331	Normal	EP2003372	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	20/07/2020	0089_SW305_200720	Normal	EP2007545	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	22/09/2020	0089_SW305_200922	Normal	EP2010145	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	15/12/2020	0089_SW305_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	15/03/2021	0089_SW305_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	10/06/2021	0089_SW305_210610	Normal	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	1/09/2021	0089_SW305_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	11/01/2022	0089_SW305_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	18/03/2022	0089_SW305_220318	Normal	EP2203195	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	8/06/2022	0089_SW305_220608	Normal	EP2206973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	5/09/2022	0089_QC115_220905	Field Duplicate	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW305	5/09/2022	0089_QC215_220905	Interlab Duplicate	920981	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW305	5/09/2022	0089_SW305_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	SW309	18/04/2018	0089_SW309_180418	Normal	209573	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW309	10/01/2020	0089_QC101_200110	Field Duplicate	EP2000292	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	10/01/2020	0089_QC201_200110	Interlab Duplicate	696578	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW309	10/01/2020	0089_SW309_200110	Normal	EP2000292	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	31/03/2020	0089_SW309_200331	Normal	EP2003369	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	22/07/2020	0089_SW309_200722	Normal	EP2007649	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	23/09/2020	0089_SW309_200923	Normal	EP2010222	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	15/12/2020	0089_QC112_201215	Field Duplicate	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	15/12/2020	0089_QC212_201115	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW309	15/12/2020	0089_SW309_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	17/03/2021	0089_SW309_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	9/06/2021	0089_SW309_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	31/08/2021	0089_QC114_210831	Field Duplicate	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	31/08/2021	0089_QC214_210831	Interlab Duplicate	821197	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW309	31/08/2021	0089_SW309_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	13/01/2022	0089_SW309_220113	Normal	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	16/03/2022	0089_SW309_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	7/06/2022	0089_SW309_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW309	6/09/2022	0089_SW309_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	30/04/2018	0089_SW310_180430	Normal	209959	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW310	10/01/2020	0089_SW310_200110	Normal	EP2000292	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	31/03/2020	0089_SW310_200331	Normal	EP2003369	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	22/07/2020	0089_SW310_200722	Normal	EP2007649	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 3 - Surface Water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Helicopter Support Facility	SW310	23/09/2020	0089_SW310_200923	Normal	EP2010222	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	15/12/2020	0089_SW310_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	17/03/2021	0089_SW310_210317	Normal	EP2102890	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	9/06/2021	0089_SW310_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	31/08/2021	0089_SW310_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	13/01/2022	0089_SW310_220113	Normal	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	16/03/2022	0089_SW310_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	7/06/2022	0089_QC103_220607	Field Duplicate	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	7/06/2022	0089_QC203_220607	Interlab Duplicate	896805	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008
	SW310	7/06/2022	0089_SW310_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW310	6/09/2022	0089_SW310_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	SW311	30/04/2018	0089_SW311_180430	Normal	209959	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW311	1/04/2020	0089_SW311_200401	Normal	EP2003418	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	22/07/2020	0089_SW311_200722	Normal	EP2007649	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	23/09/2020	0089_SW311_200923	Normal	EP2010222	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	15/12/2020	0089_SW311_201215	Normal	EP2014053	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	17/03/2021	0089_SW311_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	9/06/2021	0089_SW311_210609	Normal	EP2106519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	31/08/2021	0089_SW311_210831	Normal	EP2110072	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	13/01/2022	0089_SW311_220113	Normal	EP2200338	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	16/03/2022	0089_SW311_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	7/06/2022	0089_SW311_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW311	6/09/2022	0089_SW311_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge spoil and Careening bay	SW317	17/04/2018	0089_SW317_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW317	8/01/2020	0089_SW317_200108	Normal	EP2000183	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	10/01/2020	0089_SW317_200110	Normal	EP2000292	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	30/03/2020	0089_SW317_200330	Normal	EP2003314	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	21/07/2020	0089_SW317_200721	Normal	EP2007604	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	21/09/2020	0089_SW317_200921	Normal	EP2010083	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	14/12/2020	0089_SW317_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	15/03/2021	0089_SW317_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	10/06/2021	0089_SW317_210610	Normal	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	31/08/2021	0089_SW317_210831	Normal	EP2110068	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	13/01/2022	0089_SW317_220113	Normal	EP2200343	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	16/03/2022	0089_SW317_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	9/06/2022	0089_SW317_220609	Normal	EP2207029	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW317	6/09/2022	0089_SW317_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Dredge spoil and Careening bay	SW318	18/04/2018	0089_SW318_180418	Normal	209573	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW318	8/01/2020	0089_SW318_200108	Normal	EP2000183	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	30/03/2020	0089_QC103_200330	Field Duplicate	EP2003314	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	30/03/2020	0089_QC203_200330	Interlab Duplicate	711144	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW318	30/03/2020	0089_SW318_200330	Normal	EP2003314	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	21/07/2020	0089_SW318_200721	Normal	EP2007604	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	21/09/2020	0089_SW318_200921	Normal	EP2010083	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	14/12/2020	0089_SW318_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	15/03/2021	0089_SW318_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	10/06/2021	0089_SW318_210610	Normal	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	31/08/2021	0089_SW318_210831	Normal	EP2110068	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	13/01/2022	0089_SW318_220113	Normal	EP2200343	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	16/03/2022	0089_SW318_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	9/06/2022	0089_SW318_220609	Normal	EP2207029	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW318	6/09/2022	0089_SW318_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	18/04/2018	0089_SW319_180418	Normal	209573	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW319	8/01/2020	0089_SW319_200108	Normal	EP2000183	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	30/03/2020	0089_QC104_200330	Field Duplicate	EP2003314	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	30/03/2020	0089_QC204_200330	Interlab Duplicate	711144	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW319	30/03/2020	0089_SW319_200330	Normal	EP2003314	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 3 - Surface Water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Dredge spoil and Careening bay	SW319	21/07/2020	0089_SW319_200721	Normal	EP2007604	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	21/09/2020	0089_QC104_200921	Field Duplicate	EP2010083	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	21/09/2020	0089_QC204_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW319	21/09/2020	0089_SW319_200921	Normal	EP2010083	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	14/12/2020	0089_QC111_201214	Field Duplicate	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	14/12/2020	0089_QC211_201114	Interlab Duplicate	765054	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW319	14/12/2020	0089_SW319_201214	Normal	EP2013989	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	15/03/2021	0089_QC107_210315	Field Duplicate	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	15/03/2021	0089_QC207_210315	Interlab Duplicate	781350	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW319	15/03/2021	0089_SW319_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	10/06/2021	0089_SW319_210610	Normal	EP2106582	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	31/08/2021	0089_SW319_210831	Normal	EP2110068	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	13/01/2022	0089_SW319_220113	Normal	EP2200343	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	16/03/2022	0089_SW319_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	9/06/2022	0089_SW319_220609	Normal	EP2207029	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW319	6/09/2022	0089_SW319_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste Water Treatment Plant	SW353	19/04/2018	0089_SW353_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW353	30/01/2020	0089_SW353_200130	Normal	EP2001004	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	2/04/2020	0089_SW353_200402	Normal	EP2003473	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	21/07/2020	0089_SW353_200721	Normal	EP2007595	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	23/09/2020	0089_SW353_200923	Normal	EP2010222	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	16/12/2020	0089_SW353_201216	Normal	EP2014090	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	17/03/2021	0089_SW353_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	8/06/2021	0089_SW353_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	30/08/2021	0089_SW353_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	11/01/2022	0089_SW353_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	14/03/2022	0089_SW353_220314	Normal	EP2202980	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	7/06/2022	0089_SW353_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW353	7/09/2022	0089_SW353_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste Water Treatment Plant	SW370	17/04/2018	0089_SW370_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW370	9/01/2020	0089_SW370_200109	Normal	EP2000249	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	31/03/2020	0089_SW370_200331	Normal	EP2003372	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	15/07/2020	0089_SW370_200715	Normal	EP2007383	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	24/09/2020	0089_SW370_200924	Normal	EP2010274	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	15/12/2020	0089_SW370_201215	Normal	EP2014053	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	16/03/2021	0089_SW370_210316	Normal	EP2102834	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	9/06/2021	0089_SW370_210609	Normal	EP2106517	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	1/09/2021	0089_SW370_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	10/01/2022	0089_SW370_220110	Normal	EP2200215	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	14/03/2022	0089_SW370_220314	Normal	EP2202977	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	7/06/2022	0089_SW370_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW370	5/09/2022	0089_SW370_220905	Normal	EP2211341	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste Water Treatment Plant	SW371	17/04/2018	0089_SW371_180417	Normal	209522	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW371	8/01/2020	0089_SW371_200108	Normal	EP2000183	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	1/04/2020	0089_SW371_200401	Normal	EP2003414	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	20/07/2020	0089_SW371_200720	Normal	EP2007545	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	22/09/2020	0089_SW371_200922	Normal	EP2010145	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	15/12/2020	0089_SW371_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	15/03/2021	0089_QC103_210315	Field Duplicate	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	15/03/2021	0089_QC203_210315	Interlab Duplicate	781350	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW371	15/03/2021	0089_SW371_210315	Normal	EP2102758	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	10/06/2021	0089_SW371_210610	Normal	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	1/09/2021	0089_SW371_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	11/01/2022	0089_SW371_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	18/03/2022	0089_SW371_220318	Normal	EP2203195	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	8/06/2022	0089_SW371_220608	Normal	EP2206973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW371	5/09/2022	0089_SW371_220905	Normal	EP2211344	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 3 - Surface Water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Waste Water Treatment Plant	SW372	13/04/2018	0089_SW372_180413	Normal	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW372	8/01/2020	0089_SW372_200108	Normal	EP2000183	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	31/03/2020	0089_SW372_200331	Normal	EP2003372	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	20/07/2020	0089_SW372_200720	Normal	EP2007545	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	22/09/2020	0089_SW372_200922	Normal	EP2010145	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	15/12/2020	0089_SW372_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	17/03/2021	0089_SW372_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	10/06/2021	0089_SW372_210610	Normal	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	1/09/2021	0089_SW372_210901	Normal	EP2110154	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	12/01/2022	0089_QC116_220112	Field Duplicate	EP2200289	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	12/01/2022	0089_QC216_220112	Interlab Duplicate	855202	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW372	12/01/2022	0089_SW372_220112	Normal	EP2200289	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	18/03/2022	0089_SW372_220318	Normal	EP2203195	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	8/06/2022	0089_SW372_220608	Normal	EP2206973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW372	6/09/2022	0089_SW372_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste Water Treatment Plant	SW373	13/04/2018	0089_SW373_180413	Normal	209417	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW373	8/01/2020	0089_SW373_200108	Normal	EP2000183	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	31/03/2020	0089_SW373_200331	Normal	EP2003372	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	20/07/2020	0089_SW373_200720	Normal	EP2007545	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	22/09/2020	0089_SW373_200922	Normal	EP2010145	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	15/12/2020	0089_SW373_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	17/03/2021	0089_SW373_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	10/06/2021	0089_MW373_210610	Normal	EP2106579	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	30/08/2021	0089_SW373_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	12/01/2022	0089_SW373_220112	Normal	EP2200289	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	18/03/2022	0089_SW373_220318	Normal	EP2203195	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	8/06/2022	0089_SW373_220608	Normal	EP2206973	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW373	6/09/2022	0089_SW373_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste Water Treatment Plant	SW382	19/04/2018	0089_SW382_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW382	30/01/2020	0089_SW382_200130	Normal	EP2001004	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	2/04/2020	0089_SW382_200402	Normal	EP2003473	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	21/07/2020	0089_SW382_200721	Normal	EP2007595	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	23/09/2020	0089_SW382_200923	Normal	EP2010218	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	16/12/2020	0089_SW382_201216	Normal	EP2014104	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	17/03/2021	0089_SW382_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	8/06/2021	0089_SW382_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	30/08/2021	0089_SW382_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	11/01/2022	0089_SW382_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	14/03/2022	0089_SW382_220314	Normal	EP2202980	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	7/06/2022	0089_SW382_220607	Normal	EP2206881	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW382	7/09/2022	0089_SW382_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Waste Water Treatment Plant	SW383	19/04/2018	0089_SW383_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW383	30/01/2020	0089_SW383_200130	Normal	EP2001004	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	2/04/2020	0089_SW383_200402	Normal	EP2003473	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	21/07/2020	0089_SW383_200721	Normal	EP2007595	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	23/09/2020	0089_SW383_200923	Normal	EP2010222	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	16/12/2020	0089_SW383_201216	Normal	EP2014090	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	17/03/2021	0089_SW383_210317	Normal	EP2102892	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	8/06/2021	0089_SW383_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	30/08/2021	0089_SW383_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	11/01/2022	0089_SW383_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	7/06/2022	0089_SW383_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW383	7/09/2022	0089_SW383_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	19/04/2018	0089_SW384_180419	Normal	209623	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05
	SW384	30/01/2020	0089_SW384_200130	Normal	EP2001004	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	2/04/2020	0089_SW384_200402	Normal	EP2003473	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	21/07/2020	0089_SW384_200721	Normal	EP2007595	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 3 - Surface Water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
					Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Waste Water Treatment Plant	SW384	23/09/2020	0089_SW384_200923	Normal	EP2010222	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	16/12/2020	0089_SW384_201216	Normal	EP2014090	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	17/03/2021	0089_SW384_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	8/06/2021	0089_SW384_210608	Normal	EP2106450	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	30/08/2021	0089_SW384_210830	Normal	EP2110017	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	11/01/2022	0089_SW384_220111	Normal	EP2200240	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	14/03/2022	0089_SW384_220314	Normal	EP2202980	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	7/06/2022	0089_SW384_220607	Normal	EP2206884	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW384	7/09/2022	0089_SW384_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	SW406	14/01/2020	0089_SW406_200114	Normal	EP2000422	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	1/04/2020	0089_SW406_200401	Normal	EP2003420	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	22/07/2020	0089_QC113_200722	Field Duplicate	EP2007649	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	22/07/2020	0089_QC213_200722	Interlab Duplicate	734409	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW406	22/07/2020	0089_SW406_200722	Normal	EP2007649	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	21/09/2020	0089_QC111_200921	Field Duplicate	EP2010083	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	21/09/2020	0089_QC211_200921	Interlab Duplicate	746269	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW406	21/09/2020	0089_SW406_200921	Normal	EP2010083	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	15/12/2020	0089_SW406_201215	Normal	EP2014048	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	15/03/2021	0089_SW406_210315	Normal	EP2102756	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	10/06/2021	0089_SW406_210610	Normal	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	31/08/2021	0089_SW406_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	14/01/2022	0089_SW406_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	16/03/2022	0089_SW406_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	7/06/2022	0089_SW406_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW406	7/09/2022	0089_SW406_220907	Normal	EP2211496	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	SW408	14/01/2020	0089_SW408_200114	Normal	EP2000422	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	1/04/2020	0089_SW408_200401	Normal	EP2003420	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	22/07/2020	0089_SW408_200722	Normal	EP2007649	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	21/09/2020	0089_SW408_200921	Normal	EP2010083	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	15/12/2020	0089_SW408_201215	Normal	EP2014053	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	15/03/2021	0089_SW408_210315	Normal	EP2102756	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	10/06/2021	0089_SW408_210610	Normal	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	31/08/2021	0089_SW408_210831	Normal	EP2110072	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	14/01/2022	0089_SW408_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	16/03/2022	0089_SW408_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	7/06/2022	0089_SW408_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW408	7/09/2022	0089_SW408_220907	Normal	EP2211498	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	SW410	14/01/2020	0089_SW410_200114	Normal	EP2000422	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	2/04/2020	0089_SW410_200402	Normal	EP2003471	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	21/07/2020	0089_SW410_200721	Normal	EP2007604	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	22/09/2020	0089_SW410_200922	Normal	EP2010145	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	15/12/2020	0089_SW410_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	17/03/2021	0089_SW410_210317	Normal	EP2102901	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	10/06/2021	0089_QC114_210610	Field Duplicate	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	10/06/2021	0089_QC214_210610	Interlab Duplicate	802734	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	SW410	10/06/2021	0089_SW410_210610	Normal	EP2106590	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	31/08/2021	0089_SW410_210831	Normal	EP2110065	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	14/01/2022	0089_SW410_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	16/03/2022	0089_SW410_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	7/06/2022	0089_SW410_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW410	6/09/2022	0089_SW410_220906	Normal	EP2211391	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	SW412	14/01/2020	0089_SW412_200114	Normal	EP2000422	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	1/04/2020	0089_SW412_200401	Normal	EP2003418	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	21/07/2020	0089_SW412_200721	Normal	EP2007604	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	22/09/2020	0089_SW412_200922	Normal	EP2010145	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	15/12/2020	0089_SW412_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	18/03/2021	0089_SW412_210318	Normal	EP2102956	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

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Table 3 - Surface Water Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides						
						Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting						0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008
PFAS NEMP 2020 Drinking Water																			
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																			
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Helicopter Support Facility	SW412	9/06/2021	0089_SW412_210609	Normal	EP2106517	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	1/09/2021	0089_SW412_210901	Normal	EP2110155	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	14/01/2022	0089_SW412_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	16/03/2022	0089_SW412_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	7/06/2022	0089_SW412_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW412	6/09/2022	0089_SW412_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	SW414	14/01/2020	0089_SW414_200114	Normal	EP2000422	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	2/04/2020	0089_SW414_200402	Normal	EP2003473	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	21/07/2020	0089_SW414_200721	Normal	EP2007604	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	22/09/2020	0089_SW414_200922	Normal	EP2010145	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	15/12/2020	0089_SW414_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	18/03/2021	0089_SW414_210318	Normal	EP2102941	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	9/06/2021	0089_SW414_210609	Normal	EP2106517	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	1/09/2021	0089_SW414_210901	Normal	EP2110155	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	14/01/2022	0089_SW414_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	16/03/2022	0089_SW414_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	7/06/2022	0089_QC116_220607	Field Duplicate	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	7/06/2022	0089_QC216_220607	Interlab Duplicate	896805	<0.001	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008
	SW414	7/06/2022	0089_SW414_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW414	6/09/2022	0089_SW414_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
Helicopter Support Facility	SW416	14/01/2020	0089_SW416_200114	Normal	EP2000422	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	2/04/2020	0089_SW416_200402	Normal	EP2003473	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	21/07/2020	0089_SW416_200721	Normal	EP2007604	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	22/09/2020	0089_SW416_200922	Normal	EP2010145	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	15/12/2020	0089_SW416_201215	Normal	EP2014044	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	18/03/2021	0089_SW416_210318	Normal	EP2102941	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	9/06/2021	0089_SW416_210609	Normal	EP2106517	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	1/09/2021	0089_SW416_210901	Normal	EP2110155	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	14/01/2022	0089_SW416_220114	Normal	EP2200400	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	16/03/2022	0089_SW416_220316	Normal	EP2203058	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	7/06/2022	0089_SW416_220607	Normal	EP2206887	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	SW416	6/09/2022	0089_SW416_220906	Normal	EP2211401	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:
First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

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Table 3 - Surface Water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.002	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Fire Training Area	SW130	17/07/2017	0089_SW130_170717	Normal	198331													
	SW130	8/01/2020	0089_SW130_200108	Normal	EP2000180	<0.01	<0.01	<0.01	112	117	620	689	20,000	5.25	2,590	508	1,540	593	12,000
	SW130	30/03/2020	0089_SW130_200330	Normal	EP2003316	<0.01	<0.01	<0.01	117	117	609	695	19,500	6.60	2,720	523	1,630	673	11,900
	SW130	15/07/2020	0089_SW130_200715	Normal	EP2007383	0.03	0.03	0.03	124	124	589	654	18,800	5.24	2,720	467	1,410	586	11,500
	SW130	22/09/2020	0089_SW130_200922	Normal	EP2010153	<0.01	<0.01	<0.01	132	132	613	674	19,600	4.72	2,760	485	1,510	641	11,700
	SW130	14/12/2020	0089_SW130_201214	Normal	EP2013985	<0.01	0.09	0.09	134	134	622	704	19,800	6.18	2,910	498	1,590	677	12,200
	SW130	15/03/2021	0089_SW130_210315	Normal	EP2102756	0.02	0.02	0.02	108	108	589	714	18,700	9.61	2,850	491	1,570	658	12,500
	SW130	8/06/2021	0089_SW130_210608	Normal	EP2106465	0.05	0.05	0.05	117	117	592	650	18,900	4.68	2,720	464	1,460	606	11,300
	SW130	30/08/2021	0089_SW130_210830	Normal	EP2110021	<0.01	<0.01	<0.01	119	119	559	583	17,700	2.09	2,770	424	1,310	584	10,100
	SW130	10/01/2022	0089_SW130_220110	Normal	EP2200215	0.02	0.02	0.02	128	128	621	603	20,000	1.50	2,630	434	1,290	556	10,600
	SW130	14/03/2022	0089_SW130_220314	Normal	EP2202977	<0.01	<0.01	<0.01	120	120	625	681	20,100	4.24	2,690	478	1,550	632	11,800
	SW130	7/06/2022	0089_SW130_220607	Normal	EP2206881	<0.01	<0.01	<0.01	123	123	562	542	18,000	1.72	2,470	435	1,250	544	9,290
	SW130	5/09/2022	0089_SW130_220905	Normal	EP2211344	<0.01	<0.01	<0.01	133	133	583	620	18,700	3.07	2,560	426	1,380	617	10,800
Fire Training Area	SW132	17/07/2017	0089_QC1SW_170717	Field Duplicate	198331				120				20,000	-1.6		400	1,200	380	11,000
	SW132	17/07/2017	0089_QC2SW_170717	Interlab Duplicate	555139				100				21,000						
	SW132	17/07/2017	0089_SW132_170717	Normal	198331				140				20,000	-0.52		410	1,300	380	11,000
	SW132	8/01/2020	0089_SW132_200108	Normal	EP2000180	<0.01	<0.01	<0.01	112	118	628	700	20,200	5.41	2,690	514	1,560	601	12,200
	SW132	30/03/2020	0089_SW132_200330	Normal	EP2003316	<0.01	<0.01	<0.01	120	120	609	726	19,500	8.80	2,720	535	1,680	700	12,500
	SW132	15/07/2020	0089_QC103_200715	Field Duplicate	EP2007383	0.02	0.02	0.02	124	124	592	631	18,900	3.12	2,730	448	1,350	563	11,100
	SW132	15/07/2020	0089_QC203_200215	Interlab Duplicate	732844	<0.01	<0.05	<0.1	120	120			20,000						
	SW132	15/07/2020	0089_SW132_200715	Normal	EP2007383	0.07	0.07	0.07	123	123	593	671	18,900	6.19	2,740	474	1,440	602	11,800
	SW132	22/09/2020	0089_SW132_200922	Normal	EP2010153	0.04	0.04	0.04	134	134	619	661	19,800	3.31	2,760	462	1,480	625	11,500
	SW132	14/12/2020	0089_QC107_201214	Field Duplicate	EP2013988	<0.01	<0.01	<0.01	125	125	638	728	20,300	6.60	3,030	527	1,650	712	12,600
	SW132	14/12/2020	0089_QC207_201114	Interlab Duplicate	765054	<0.01	0.09	<0.1	150	150			20,000						
	SW132	14/12/2020	0089_SW132_201214	Normal	EP2013988	<0.01	<0.01	<0.01	124	124	639	765	20,300	8.99	3,050	561	1,740	757	13,200
	SW132	15/03/2021	0089_SW132_210315	Normal	EP2102756	0.03	0.03	0.03	118	118	647	646	20,800	0.07	2,790	424	1,290	392	11,700
	SW132	8/06/2021	0089_SW132_210608	Normal	EP2106465	0.01	0.01	0.01	117	117	588	618	18,800	2.51	2,660	441	1,410	580	10,700
	SW132	30/08/2021	0089_SW132_210830	Normal	EP2110021	<0.01	<0.01	<0.01	120	120	547	578	17,500	2.69	2,470	420	1,300	578	10,000
	SW132	10/01/2022	0089_SW132_220110	Normal	EP2200215	0.02	0.02	0.02	127	127	616	585	19,800	2.51	2,620	418	1,250	534	10,300
	SW132	14/03/2022	0089_SW132_220314	Normal	EP2202977	<0.01	<0.01	<0.01	121	121	632	697	20,300	4.89	2,740	486	1,580	643	12,100
	SW132	7/06/2022	0089_SW132_220607	Normal	EP2206881	<0.01	<0.01	<0.01	130	130	574	549	18,400	2.20	2,500	442	1,270	546	9,390
	SW132	5/09/2022	0089_QC104_220905	Field Duplicate	EP2211344	<0.01	<0.01	<0.01	126	126	569	592	18,200	2.00	2,550	410	1,320	590	10,300
	SW132	5/09/2022	0089_QC204_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.1											
	SW132	5/09/2022	0089_SW132_220905	Normal	EP2211344	<0.01	<0.01	<0.01	125	125	575	627	18,400	4.27	2,590	431	1,400	623	10,900
Fire Training Area	SW134	17/07/2017	0089_SW134_170717	Normal	198331														
	SW134	8/01/2020	0089_QC109_200108	Field Duplicate	EP2000180	<0.01	<0.01	<0.01	115	119	620	734	20,000	8.44	2,550	541	1,630	622	12,800
	SW134	8/01/2020	0089_QC209_200108	Interlab Duplicate	696100	<0.01	<0.05	<0.1	130				32,000						
	SW134	8/01/2020	0089_SW134_200108	Normal	EP2000180	<0.01	<0.01	<0.01	115	118	621	723	19,900	7.57	2,750	531	1,610	609	12,600
	SW134	31/03/2020	0089_QC101_200331	Field Duplicate	EP2003367	<0.01	<0.01	<0.01	126	126	608	732	19,400	9.30	2,780	541	1,740	717	12,500
	SW134	31/03/2020	0089_QC201_200331	Interlab Duplicate	711434	<0.01	<0.05	<0.1	130	130			22,000						
	SW134	31/03/2020	0089_SW134_200331	Normal	EP2003367	<0.01	<0.01	<0.01	130	130	613	736	19,600	9.16	2,760	542	1,740	713	12,600
	SW134	15/07/2020	0089_SW134_200715	Normal	EP2007383	<0.01	<0.01	<0.01	123	123	596	687	19,000	7.13	2,760	486	1,470	621	12,100
	SW134	22/09/2020	0089_QC116_200922	Field Duplicate	EP2010153	0.01	0.01	0.01	134	134	619	661	19,800	3.29	2,780	462	1,480	629	11,500
	SW134	22/09/2020	0089_QC216_200921	Interlab Duplicate	746269	<0.01	<0.05	<0.1	120	120			20,000						
	SW134	22/09/2020	0089_SW134_200922	Normal	EP2010153	0.01	0.01	0.01	135	135	610	701	19,500	6.97	2,750	489	1,570	670	12,200
	SW134	14/12/2020	0089_SW134_201214	Normal	EP2013988	<0.01	<0.01	<0.01	133	133	635	739	20,200	7.57	3,020	535	1,670	726	12,800
	SW134	15/03/2021	0089_SW134_210315	Normal	EP2102756	0.03	0.03	0.03	113	113	592	721	18,900	9.76	2,740	495	1,590	666	12,600
	SW134	8/06/2021	0089_QC110_210608	Field Duplicate	EP2106450	<0.01	<0.01	<0.01	117	117	571	671	18,100	8.02	2,790	462	1,490	626	11,700
	SW134	8/06/2021	0089_QC210_210608	Interlab Duplicate	802464	0.01	<0.05	<0.1	120				20,000						
	SW134	8/06/2021	0089_SW134_210608	Normal	EP2106450	<0.01	<0.01	<0.01	116	116	562	676	17,800	9.18	2,780	467	1,500	626	11,800
	SW134	30/08/2021	0089_QC104_210830	Field Duplicate	EP2110021	<0.01	<0.01	<0.01	120	120	551	594	17,600	3.78	2,500	430	1,330	595	10,300
	SW134	30/08/2021	0089_QC204_210830	Interlab Duplicate	820919	<0.01	<0.05	<0.1											
	SW134	30/08/2021	0089_SW134_210830	Normal	EP2110021	<0.01	<0.01	<0.01	117	117	558	600	17,800	3.69	2,560	435	1,350	600	10,400
	SW134	10/01/2022	0089_QC102_220110	Field Duplicate	EP2200212	0.03	0.03	0.03											
	SW134	10/01/2022	0089_QC202_220110	Interlab Duplicate	854607	0.03	<0.05	<0.1											

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Table 3 - Surface Water Analytical Results

						PFAS			Inorganics										
						Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.002	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water						*0.07*													
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water						**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	SW134	10/01/2022	0089_SW134_220110	Normal	EP2200212	0.03	0.03	0.03	126	126	609	585	19,600	1.94	2,560	418	1,250	537	10,300
	SW134	14/03/2022	0089_QC107_220314	Field Duplicate	EP2202977	<0.01	<0.01	<0.01	122	122	636	674	20,500	2.92	2,650	473	1,530	616	11,700
	SW134	14/03/2022	0089_QC207_220314	Interlab Duplicate	872911	<0.01	<0.05	<0.1											
	SW134	14/03/2022	0089_SW134_220314	Normal	EP2202977	<0.01	<0.01	<0.01	121	121	629	697	20,200	5.16	2,720	492	1,580	639	12,100
	SW134	7/06/2022	0089_QC108_220607	Field Duplicate	EP2206881	0.01	0.01	0.01											
	SW134	7/06/2022	0089_QC208_220607	Interlab Duplicate	896805	0.031	0.033	0.033											
	SW134	7/06/2022	0089_SW134_220607	Normal	EP2206881	0.02	0.02	0.02	128	128	579	564	18,600	1.33	2,490	457	1,310	561	9,630
	SW134	5/09/2022	0089_SW134_220905	Normal	EP2211344	<0.01	<0.01	<0.01	127	127	586	620	18,800	2.81	2,570	424	1,380	618	10,800
	SW150	24/08/2017	0089_SW150_170824	Normal	199846														
	SW150	8/01/2020	0089_SW150_200108	Normal	EP2000180	<0.01	<0.01	<0.01	118	118	538	655	17,200	9.84	2,410	454	1,470	610	11,400
	SW150	30/03/2020	0089_SW150_200330	Normal	EP2003309	<0.01	<0.01	<0.01	115	115	578	692	18,400	8.92	2,750	485	1,560	680	12,000
	SW150	20/07/2020	0089_SW150_200720	Normal	EP2007545	<0.01	<0.01	<0.01	122	122	596	702	19,100	8.16	2,650	493	1,540	624	12,300
	SW150	23/09/2020	0089_SW150_200923	Normal	EP2010218	<0.01	<0.01	<0.01	124	124	615	658	19,500	3.37	3,020	474	1,490	635	11,400
	SW150	14/12/2020	0089_SW150_201214	Normal	EP2013973	<0.01	<0.01	<0.01	121	121	609	724	19,400	8.62	2,840	518	1,650	716	12,500
	SW150	16/03/2021	0089_SW150_210316	Normal	EP2102836	<0.01	<0.01	<0.01	113	113	653	768	20,900	8.12	2,940	542	1,700	732	13,400
	SW150	8/06/2021	0089_QC109_210608	Field Duplicate	EP2106465	<0.01	<0.01	<0.01	113	113	592	639	18,900	3.84	2,720	454	1,440	601	11,100
	SW150	8/06/2021	0089_QC209_210608	Interlab Duplicate	802464	<0.01	<0.05	<0.1	110				20,000						
Demolition ground	SW150	8/06/2021	0089_SW150_210608	Normal	EP2106465	<0.01	<0.01	<0.01	114	114	597	621	19,100	1.98	2,670	438	1,390	578	10,800
	SW150	30/08/2021	0089_QC108_210830	Field Duplicate	EP2110017	<0.01	<0.01	<0.01	120	120	538	575	17,200	3.37	2,400	420	1,290	574	9,960
	SW150	30/08/2021	0089_QC208_210830	Interlab Duplicate	820919	<0.01	<0.05	<0.1											
	SW150	30/08/2021	0089_SW150_210830	Normal	EP2110017	<0.01	<0.01	<0.01	123	123	547	612	17,500	5.58	2,440	445	1,370	606	10,600
	SW150	10/01/2022	0089_SW150_220110	Normal	EP2200218	<0.01	<0.01	<0.01	120	120	613	671	19,800	4.54	2,490	440	1,420	572	11,900
	SW150	15/03/2022	0089_QC117_220315	Field Duplicate	EP2203019	<0.01	<0.01	<0.01	120	120	590	691	18,900	7.91	2,600	481	1,560	650	12,000
	SW150	15/03/2022	0089_QC217_220315	Interlab Duplicate	872903	<0.01	<0.05	<0.1											
	SW150	15/03/2022	0089_SW150_220315	Normal	EP2203019	<0.01	<0.01	<0.01	123	123	587	623	18,800	3.02	2,600	439	1,420	584	10,800
	SW150	8/06/2022	0089_SW150_220608	Normal	EP2206970	<0.01	<0.01	<0.01	130	130	554	641	17,500	7.29	2,770	459	1,510	603	11,000
	SW150	5/09/2022	0089_SW150_220905	Normal	EP2211347	<0.01	<0.01	<0.01	125	125	576	608	18,400	2.70	2,600	426	1,370	489	10,600
	SW152	24/08/2017	0089_SW152_170824	Normal	199846				130				19,000	-0.4		410	1,300	390	11,000
	SW152	8/01/2020	0089_SW152_200108	Normal	EP2000180	<0.01	<0.01	<0.01	111	111	602	711	19,400	8.31	2,520	526	1,580	600	12,400
	SW152	30/03/2020	0089_SW152_200330	Normal	EP2003309	<0.01	<0.01	<0.01	115	115	584	736	18,600	11.6	2,740	516	1,650	714	12,800
	SW152	20/07/2020	0089_SW152_200720	Normal	EP2007545	<0.01	<0.01	<0.01	123	123	599	685	19,200	6.64	2,660	480	1,500	603	12,000
	SW152	23/09/2020	0089_SW152_200923	Normal	EP2010218	<0.01	<0.01	<0.01	125	125	605	692	19,200	6.70	2,920	489	1,560	666	12,000
	SW152	14/12/2020	0089_SW152_201214	Normal	EP2013973	<0.01	<0.01	<0.01	120	120	608	688	19,400	6.16	2,810	495	1,560	677	11,900
	SW152	16/03/2021	0089_SW152_210316	Normal	EP2102836	<0.01	<0.01	<0.01	114	114	656	725	21,000	5.00	2,930	515	1,620	690	12,600
Demolition ground	SW152	8/06/2021	0089_SW152_210608	Normal	EP2106465	<0.01	<0.01	<0.01	113	113	589	650	18,800	4.97	2,700	463	1,460	611	11,300
	SW152	30/08/2021	0089_SW152_210830	Normal	EP2110017	<0.01	<0.01	<0.01	105	105	554	578	17,400	2.05	2,950	417	1,300	577	10,000
	SW152	10/01/2022	0089_SW152_220110	Normal	EP2200218	<0.01	<0.01	<0.01	138	138	613	664	19,800	4.00	2,500	433	1,400	562	11,800
	SW152	15/03/2022	0089_SW152_220315	Normal	EP2203019	<0.01	<0.01	<0.01	121	121	592	669	19,000	6.06	2,600	465	1,520	631	11,600
	SW152	8/06/2022	0089_SW152_220608	Normal	EP2206970	<0.01	<0.01	<0.01	125	125	551	653	17,700	8.51	2,350	472	1,540	616	11,200
	SW152	5/09/2022	0089_QC103_220905	Field Duplicate	EP2211347	<0.01	<0.01	<0.01	122	122	574	613	18,300	3.27	2,670	430	1,380	495	10,700
	SW152	5/09/2022	0089_QC203_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.1											
	SW152	5/09/2022	0089_SW152_220905	Normal	EP2211347	<0.01	<0.01	<0.01	122	122	578	612	18,500	2.81	2,590	424	1,370	484	10,700
	SW154	24/08/2017	0089_SW154_170824	Normal	199846				130				20,000	1.2		420	1,300	400	11,000
	SW154	8/01/2020	0089_QC104_200108	Field Duplicate	EP2000180	<0.01	<0.01	<0.01	116	116	594	715	18,900	9.24	2,820	522	1,580	602	12,500
	SW154	8/01/2020	0089_QC204_200108	Interlab Duplicate	696100	<0.01	<0.05	<0.1	140				21,000						
	SW154	8/01/2020	0089_SW154_200108	Normal	EP2000180	<0.01	<0.01	<0.01	118	118	576	700	18,400	9.68	2,650	515	1,560	600	12,200
	SW154	30/03/2020	0089_SW154_200330	Normal	EP2003309	<0.01	<0.01	<0.01	115	115	583	714	18,600	10.1	2,710	497	1,610	700	12,400
	SW154	20/07/2020	0089_SW154_200720	Normal	EP2007545	<0.01	<0.01	<0.01	123	123	585	652	18,700	5.38	2,660	458	1,440	574	11,400
	SW154	22/09/2020	0089_SW154_200922	Normal	EP2010153	<0.01	<0.01	<0.01	124	124	619	695	19,800	5.79	2,800	494	1,550	662	12,100
	SW154	14/12/2020	0089_SW154_201214	Normal	EP2013989	<0.01	<0.01	<0.01	122	122	636	733	20,200	7.11	3,050	518	1,660	714	12,700
Demolition ground	SW154	16/03/2021	0089_SW154_210316	Normal	EP2102836	<0.01	<0.01	<0.01	114	114	663	702	21,300	2.84	2,870	493	1,570	670	12,200
	SW154	8/06/2021	0089_SW154_210608	Normal	EP2106465	<0.01	<0.01	<0.01	111	111	588	651	18,800	5.16	2,640	465	1,470	614	11,300
	SW154	30/08/2021	0089_SW154_210830	Normal	EP2110017	<0.01	<0.01	<0.01	115	115	547	568	17,500	1.88	2,440	406	1,270	566	9,850
	SW154	10/01/2022	0089_SW154_220110	Normal	EP2200218	<0.01	<0.01	<0.01	120	120	591	660	19,000	5.55	2,510	433	1,400	561	11,700
	SW154	15/03/2022	0089_QC113_220315	Field Duplicate	EP2203019	<0.01	<0.01	<0.01											
	SW154	15/03/2022	0089_QC213_220315	Interlab Duplicate	872903	<0.01	<0.05	<0.1											
	SW154	15/03/2022	0089_SW154_220315	Normal	EP2203019	<0.01	<0.01	<0.01	119	119	603	662	19,400	4.68	2,580	461	1,500	622	11,500

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Table 3 - Surface Water Analytical Results

						PFAS			Inorganics										
						Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.002	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water						*0.07*													
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water						**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
	SW154	8/06/2022	0089_SW154_220608	Normal	EP2206970	<0.01	<0.01	<0.01	125	125	531	636	16,800	9.00	2,620	460	1,500	602	10,900
	SW154	5/09/2022	0089_SW154_220905	Normal	EP2211347	<0.01	<0.01	<0.01	122	122	574	624	18,400	4.16	2,520	435	1,400	498	10,900
Demolition ground	SW156	24/08/2017	0089_SW156_170824	Normal	199846														
	SW156	8/01/2020	0089_SW156_200108	Normal	EP2000180	<0.01	<0.01	<0.01	118	118	642	745	20,200	7.37	3,380	549	1,650	629	13,000
	SW156	30/03/2020	0089_SW156_200330	Normal	EP2003309	<0.01	<0.01	<0.01	114	114	562	709	17,800	11.6	2,750	500	1,600	688	12,300
	SW156	20/07/2020	0089_SW156_200720	Normal	EP2007545	<0.01	<0.01	<0.01	123	123	594	679	19,000	6.74	2,650	478	1,490	601	11,900
	SW156	23/09/2020	0089_SW156_200923	Normal	EP2010218	<0.01	<0.01	<0.01	125	125	619	664	19,700	3.53	2,920	469	1,510	641	11,500
	SW156	14/12/2020	0089_SW156_201214	Normal	EP2013989	<0.01	<0.01	<0.01	121	121	620	721	19,600	7.53	3,120	513	1,630	697	12,500
	SW156	16/03/2021	0089_QC111_210316	Field Duplicate	EP2102836	<0.01	<0.01	<0.01	116	116	650	735	20,800	6.07	2,950	520	1,630	694	12,800
	SW156	16/03/2021	0089_QC211_210316	Interlab Duplicate	781350	0.02	<0.05	<0.1	130				23,000						
	SW156	16/03/2021	0089_SW156_210316	Normal	EP2102836	<0.01	<0.01	<0.01	113	113	663	739	21,200	5.43	3,000	515	1,630	700	12,900
	SW156	8/06/2021	0089_SW156_210608	Normal	EP2106465	<0.01	<0.01	<0.01	113	113	567	656	18,000	7.24	2,750	463	1,470	618	11,400
	SW156	30/08/2021	0089_SW156_210830	Normal	EP2110017	<0.01	<0.01	<0.01	116	116	544	577	17,400	2.94	2,460	414	1,300	576	10,000
	SW156	10/01/2022	0089_QC107_220110	Field Duplicate	EP2200218	<0.01	<0.01	<0.01											
	SW156	10/01/2022	0089_QC207_220110	Interlab Duplicate	854607	<0.01	<0.05	<0.1											
	SW156	10/01/2022	0089_SW156_220110	Normal	EP2200218	<0.01	<0.01	<0.01	120	120	602	712	19,500	8.34	2,400	464	1,500	513	12,700
	SW156	15/03/2022	0089_SW156_220315	Normal	EP2203019	<0.01	<0.01	<0.01	121	121	584	658	18,700	5.98	2,590	459	1,500	619	11,400
	SW156	8/06/2022	0089_SW156_220608	Normal	EP2206970	<0.01	<0.01	<0.01	123	123	559	623	18,000	5.38	2,360	450	1,460	586	10,700
	SW156	5/09/2022	0089_SW156_220905	Normal	EP2211347	<0.01	<0.01	<0.01	122	122	577	624	18,500	3.88	2,540	434	1,400	500	10,900
Waste Water Treatment Plan	SW305	17/04/2018	0089_SW305_180417	Normal	209522														
	SW305	8/01/2020	0089_SW305_200108	Normal	EP2000183	0.02	0.02	0.02	121	124	590	679	18,800	7.02	2,760	465	1,510	558	11,900
	SW305	31/03/2020	0089_SW305_200331	Normal	EP2003372	0.04	0.04	0.04	118	118	610	740	19,500	9.67	2,750	521	1,690	719	12,800
	SW305	20/07/2020	0089_SW305_200720	Normal	EP2007545	0.02	0.02	0.02	130	130	563	686	18,000	9.79	2,550	480	1,510	608	12,000
	SW305	22/09/2020	0089_SW305_200922	Normal	EP2010145	0.02	0.02	0.02	143	143	589	566	18,800	2.00	2,690	406	1,280	538	9,810
	SW305	15/12/2020	0089_SW305_201215	Normal	EP2014048	*0.13*	0.13	0.13	125	125	613	700	19,600	6.58	2,780	510	1,580	696	12,100
	SW305	15/03/2021	0089_SW305_210315	Normal	EP2102758	*0.40*	0.40	0.40	110	110	585	714	18,600	9.99	2,780	496	1,570	658	12,500
	SW305	10/06/2021	0089_SW305_210610	Normal	EP2106582	<0.01	<0.01	<0.01	144	144	581	658	18,600	6.20	2,580	463	1,500	615	11,400
	SW305	1/09/2021	0089_SW305_210901	Normal	EP2110154	<0.01	<0.01	<0.01	118	118	534	598	17,200	5.59	2,250	422	1,340	546	10,400
	SW305	11/01/2022	0089_SW305_220111	Normal	EP2200240	0.04	0.04	0.04	132	132	595	610	19,200	1.20	2,450	416	1,350	484	10,700
	SW305	18/03/2022	0089_SW305_220318	Normal	EP2203195	<0.01	<0.01	<0.01	130	130	603	638	19,300	2.83	2,700	466	1,440	541	11,100
	SW305	8/06/2022	0089_SW305_220608	Normal	EP2206973	*0.23*	0.23	0.23	127	127	604	682	19,300	6.00	2,760	492	1,600	642	11,700
	SW305	5/09/2022	0089_QC115_220905	Field Duplicate	EP2211344	<0.01	<0.01	<0.01	152	152	532	541	17,000	0.85	2,360	378	1,210	528	9,400
	SW305	5/09/2022	0089_QC215_220905	Interlab Duplicate	920981	<0.01	<0.05	<0.1											
	SW305	5/09/2022	0089_SW305_220905	Normal	EP2211344	<0.01	<0.01	<0.01	145	145	546	551	17,500	0.43	2,390	386	1,240	544	9,560
Helicopter Support Facility	SW309	18/04/2018	0089_SW309_180418	Normal	209573														
	SW309	10/01/2020	0089_QC101_200110	Field Duplicate	EP2000292	<0.01	<0.01	<0.01	112	113	602	721	19,100	9.00	2,910	526	1,590	605	12,600
	SW309	10/01/2020	0089_QC201_200110	Interlab Duplicate	696578	<0.01	<0.05	<0.1	97				21,000						
	SW309	10/01/2020	0089_SW309_200110	Normal	EP2000292	<0.01	<0.01	<0.01	110	117	583	701	18,600	9.18	2,700	520	1,570	596	12,200
	SW309	31/03/2020	0089_SW309_200331	Normal	EP2003369	<0.01	<0.01	<0.01	115	115	607	702	19,400	7.24	2,750	511	1,660	684	12,000
	SW309	22/07/2020	0089_SW309_200722	Normal	EP2007649	<0.01	<0.01	<0.01	120	120	588	666	18,700	6.25	2,800	449	1,430	517	11,800
	SW309	23/09/2020	0089_SW309_200923	Normal	EP2010222	<0.01	<0.01	<0.01	119	119	630	678	20,200	3.60	2,800	490	1,550	652	11,700
	SW309	15/12/2020	0089_QC112_201215	Field Duplicate	EP2014048	<0.01	<0.01	<0.01	134	134	632	682	20,200	3.83	2,840	494	1,540	674	11,800
	SW309	15/12/2020	0089_QC212_201115	Interlab Duplicate	765054	<0.01	<0.05	<0.1	150	150			21,000						
	SW309	15/12/2020	0089_SW309_201215	Normal	EP2014048	<0.01	<0.01	<0.01	140	140	626	693	20,000	5.06	2,860	504	1,560	693	12,000
	SW309	17/03/2021	0089_SW309_210317	Normal	EP2102892	<0.01	<0.01	<0.01	109	109	631	565	20,200	5.55	2,850	402	1,240	528	9,870
	SW309	9/06/2021	0089_SW309_210609	Normal	EP2106519	<0.01	<0.01	<0.01	114	114	590	668	18,900	6.15	2,630	470	1,500	630	11,600
	SW309	31/08/2021	0089_QC114_210831	Field Duplicate	EP2110065	<0.01	<0.01	<0.01	117	117	556	574	17,800	1.60	2,460	399	1,300	516	9,970
	SW309	31/08/2021	0089_QC214_210831	Interlab Duplicate	821197	<0.01	<0.05	<0.1											
	SW309	31/08/2021	0089_SW309_210831	Normal	EP2110065	<0.01	<0.01	<0.01	117	117	555	579	17,800	2.12	2,450	400	1,300	517	10,100
	SW309	13/01/2022	0089_SW309_220113	Normal	EP2200338	<0.01	<0.01	<0.01	115	115	614	656	19,800	3.31	2,570	433	1,460	563	11,500
	SW309	16/03/2022	0089_SW309_220316	Normal	EP2203058	<0.01	<0.01	<0.01	123	123	597	647	19,100	4.04	2,680	452	1,480	615	11,200
	SW309	7/06/2022	0089_SW309_220607	Normal	EP2206887	<0.01	<0.01	<0.01	123	123	531	616	16,900	7.44	2,480	445	1,440	560	10,600
	SW309	6/09/2022	0089_SW309_220906	Normal	EP2211401	<0.01	<0.01	<0.01	118	118	573	619	18,300	3.88	2,620	432	1,400	500	10,800
	SW310	30/04/2018	0089_SW310_180430	Normal	209959														
	SW310	10/01/2020	0089_SW310_200110	Normal	EP2000292	<0.01	<0.01	<0.01	118	118	602	734	19,100	9.89	2,920	548	1,630	620	12,800
	SW310	31/03/2020	0089_SW310_200331	Normal	EP2003369	<0.01	<0.01	<0.01	116	116	586	669	18,600	6.69	2,810	479	1,550	696	11,500
	SW310	22/07/2020	0089_SW310_200722	Normal	EP2007649	<0.01	<0.01	<0.01	122	122	579	656	18,500	6.20	2,630	439	1,410	510	11,600

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Table 3 - Surface Water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.002	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Helicopter Support Facility	SW310	23/09/2020	0089_SW310_200923	Normal	EP2010222	<0.01	<0.01	<0.01	122	122	627	648	20,100	1.67	2,780	470	1,480	631	11,200
	SW310	15/12/2020	0089_SW310_201215	Normal	EP2014048	<0.01	<0.01	<0.01	119	119	626	683	20,000	4.33	2,870	496	1,550	679	11,800
	SW310	17/03/2021	0089_SW310_210317	Normal	EP2102890	<0.01	<0.01	<0.01	108	108	601	712	19,200	8.52	2,730	505	1,580	700	12,400
	SW310	9/06/2021	0089_SW310_210609	Normal	EP2106519	<0.01	<0.01	<0.01	115	115	578	657	18,500	6.40	2,570	466	1,480	618	11,400
	SW310	31/08/2021	0089_SW310_210831	Normal	EP2110065	<0.01	<0.01	<0.01	116	116	561	586	18,000	2.18	2,440	406	1,320	522	10,200
	SW310	13/01/2022	0089_SW310_220113	Normal	EP2200338	<0.01	<0.01	<0.01	120	120	625	674	20,200	3.75	2,540	447	1,500	579	11,800
	SW310	16/03/2022	0089_SW310_220316	Normal	EP2203058	<0.01	<0.01	<0.01	122	122	602	660	19,200	4.57	2,810	461	1,520	639	11,400
	SW310	7/06/2022	0089_QC103_220607	Field Duplicate	EP2206887	<0.01	<0.01	<0.01											
	SW310	7/06/2022	0089_QC203_220607	Interlab Duplicate	896805	0.004	0.004	0.004											
	SW310	7/06/2022	0089_SW310_220607	Normal	EP2206887	<0.01	<0.01	<0.01	122	122	536	616	17,100	6.94	2,460	444	1,440	559	10,600
	SW310	6/09/2022	0089_SW310_220906	Normal	EP2211401	<0.01	<0.01	<0.01	118	118	632	606	20,400	2.07	2,600	421	1,360	483	10,600
Helicopter Support Facility	SW311	30/04/2018	0089_SW311_180430	Normal	209959														
	SW311	1/04/2020	0089_SW311_200401	Normal	EP2003418	<0.01	<0.01	<0.01	116	116	592	695	18,800	8.02	2,840	486	1,580	734	12,000
	SW311	22/07/2020	0089_SW311_200722	Normal	EP2007649	<0.01	<0.01	<0.01	121	121	577	649	18,400	5.86	2,680	436	1,390	501	11,500
	SW311	23/09/2020	0089_SW311_200923	Normal	EP2010222	<0.01	<0.01	<0.01	120	120	634	704	20,300	5.25	2,840	495	1,600	680	12,200
	SW311	15/12/2020	0089_SW311_201215	Normal	EP2014053	<0.01	<0.01	<0.01	119	119	633	704	20,100	5.37	3,040	508	1,590	687	12,200
	SW311	17/03/2021	0089_SW311_210317	Normal	EP2102892	<0.01	<0.01	<0.01	112	112	623	612	19,800	0.86	2,970	433	1,340	575	10,700
	SW311	9/06/2021	0089_SW311_210609	Normal	EP2106519	<0.01	<0.01	<0.01	113	113	572	668	18,300	7.70	2,590	474	1,500	632	11,600
	SW311	31/08/2021	0089_SW311_210831	Normal	EP2110072	<0.01	<0.01	<0.01	117	117	548	619	17,600	6.04	2,390	430	1,380	559	10,800
	SW311	13/01/2022	0089_SW311_220113	Normal	EP2200338	<0.01	<0.01	<0.01	122	122	614	667	19,800	4.16	2,550	441	1,480	574	11,700
	SW311	16/03/2022	0089_SW311_220316	Normal	EP2203058	<0.01	<0.01	<0.01	123	123	582	648	18,500	5.35	2,760	452	1,480	626	11,200
	SW311	7/06/2022	0089_SW311_220607	Normal	EP2206887	<0.01	<0.01	<0.01	116	116	551	605	17,600	4.68	2,520	439	1,420	555	10,400
	SW311	6/09/2022	0089_SW311_220906	Normal	EP2211401	<0.01	<0.01	<0.01	118	118	583	636	18,600	4.35	2,670	444	1,430	506	11,100
Dredge spoil and Careening bay	SW317	17/04/2018	0089_SW317_180417	Normal	209522														
	SW317	8/01/2020	0089_SW317_200108	Normal	EP2000183	<0.01	<0.01	<0.01	119	119	590	664	18,900	5.86	2,640	456	1,490	552	11,600
	SW317	10/01/2020	0089_SW317_200110	Normal	EP2000292	<0.01	<0.01	<0.01	117	117	584	714	18,600	10.0	2,760	464	1,610	584	12,500
	SW317	30/03/2020	0089_SW317_200330	Normal	EP2003314	<0.01	<0.01	<0.01	117	117	601	678	19,200	6.01	2,730	508	1,590	658	11,600
	SW317	21/07/2020	0089_SW317_200721	Normal	EP2007604	0.01	0.01	0.01	120	120	576	686	18,300	8.74	2,750	539	1,500	715	11,900
	SW317	21/09/2020	0089_SW317_200921	Normal	EP2010083	<0.01	<0.01	<0.01	128	128	545	691	17,200	11.8	2,740	483	1,550	664	12,000
	SW317	14/12/2020	0089_SW317_201214	Normal	EP2013989	<0.01	<0.01	<0.01	118	118	630	724	20,000	6.98	3,040	506	1,620	694	12,600
	SW317	15/03/2021	0089_SW317_210315	Normal	EP2102758	<0.01	<0.01	<0.01	111	111	636	637	20,400	0.11	2,790	404	1,270	648	11,400
	SW317	10/06/2021	0089_SW317_210610	Normal	EP2106582	<0.01	<0.01	<0.01	113	113	573	662	18,300	7.26	2,610	461	1,500	621	11,500
	SW317	31/08/2021	0089_SW317_210831	Normal	EP2110068	<0.01	<0.01	<0.01	121	121	548	627	17,600	6.73	2,350	454	1,400	582	10,900
	SW317	13/01/2022	0089_SW317_220113	Normal	EP2200343	<0.01	<0.01	<0.01	122	122	607	712	19,900	7.97	2,060	466	1,570	608	12,500
	SW317	16/03/2022	0089_SW317_220316	Normal	EP2203058	<0.01	<0.01	<0.01	123	123	616	665	19,800	3.78	2,660	463	1,520	638	11,500
	SW317	9/06/2022	0089_SW317_220609	Normal	EP2207029	<0.01	<0.01	<0.01	123	123	554	671	17,700	9.49	2,530	484	1,580	635	11,500
	SW317	6/09/2022	0089_SW317_220906	Normal	EP2211391	<0.01	<0.01	<0.01	117	117	544	606	17,400	5.38	2,470	422	1,360	488	10,600
Dredge spoil and Careening bay	SW318	18/04/2018	0089_SW318_180418	Normal	209573														
	SW318	8/01/2020	0089_SW318_200108	Normal	EP2000183	<0.01	<0.01	<0.01	125	125	610	669	19,400	4.63	2,870	461	1,490	553	11,700
	SW318	30/03/2020	0089_QC103_200330	Field Duplicate	EP2003314	0.01	0.01	0.01	117	117	592	713	18,900	9.24	2,730	539	1,670	703	12,200
	SW318	30/03/2020	0089_QC203_200330	Interlab Duplicate	711144	0.02	<0.05	<0.1	120	120			30,000						
	SW318	30/03/2020	0089_SW318_200330	Normal	EP2003314	<0.01	<0.01	<0.01	118	118	590	714	18,800	9.54	2,730	502	1,600	694	12,400
	SW318	21/07/2020	0089_SW318_200721	Normal	EP2007604	<0.01	<0.01	<0.01	124	124	569	661	18,100	7.46	2,710	467	1,480	624	11,500
	SW318	21/09/2020	0089_SW318_200921	Normal	EP2010083	<0.01	<0.01	<0.01	136	136	548	680	17,200	10.8	2,870	490	1,520	658	11,800
	SW318	14/12/2020	0089_SW318_201214	Normal	EP2013989	<0.01	<0.01	<0.01	123	123	631	726	20,100	7.04	2,940	510	1,640	694	12,600
	SW318	15/03/2021	0089_SW318_210315	Normal	EP2102758	<0.01	<0.01	<0.01	111	111	589	709	18,700	9.18	2,870	485	1,560	653	12,400
	SW318	10/06/2021	0089_SW318_210610	Normal	EP2106582	<0.01	<0.01	<0.01	114	114	581	668	18,600	6.97	2,600	467	1,510	628	11,600
	SW318	31/08/2021	0089_SW318_210831	Normal	EP2110068	<0.01	<0.01	<0.01	122	122	551	599	17,600	4.22	2,490	435	1,350	551	10,400
	SW318	13/01/2022	0089_SW318_220113	Normal	EP2200343	<0.01	<0.01	<0.01	125	125	611	672	19,800	4.74	2,400	445	1,480	569	11,800
	SW318	16/03/2022	0089_SW318_220316	Normal	EP2203058	<0.01	<0.01	<0.01	122	122	621	676	20,000	4.20	2,620	470	1,540	643	11,700
	SW318	9/06/2022	0089_SW318_220609	Normal	EP2207029	<0.01	<0.01	<0.01	124	124	548	635	17,500	7.34	2,500	459	1,490	599	10,900
	SW318	6/09/2022	0089_SW318_220906	Normal	EP2211391	<0.01	<0.01	<0.01	120	120	550	612	17,600	5.31	2,460	422	1,370	491	10,700
	SW319	18/04/2018	0089_SW319_180418	Normal	209573														
	SW319	8/01/2020	0089_SW319_200108	Normal	EP2000183	<0.01	<0.01	<0.01	117	117	583	690	18,600	8.41	2,700	473	1,530	565	12,100
	SW319	30/03/2020	0089_QC104_200330	Field Duplicate	EP2003314	<0.01	<0.01	<0.01	116	116	590	729	18,800	10.6	2,750	508	1,620	710	12,700
	SW319	30/03/2020	0089_QC204_200330	Interlab Duplicate	711144	<0.01	<0.05	<0.1	120	120			25,000						
	SW319	30/03/2020	0089_SW319_200330	Normal	EP2003314	<0.01	<0.01	<0.01	116	116	615	744	19,700	9.48	2,750	549	1,720	720	12,800

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Table 3 - Surface Water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.002	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Dredge spoil and Careening bay	SW319	21/07/2020	0089_SW319_200721	Normal	EP2007604	*0.13*	0.13	0.13	128	128	572	634	18,200	5.14	2,670	497	1,380	652	11,000
	SW319	21/09/2020	0089_QC104_200921	Field Duplicate	EP2010083	<0.01	<0.01	<0.01	125	125	540	651	17,000	9.32	2,780	422	1,490	613	11,300
	SW319	21/09/2020	0089_QC204_200921	Interlab Duplicate	746269	<0.01	<0.05	<0.1	110	110			18,000						
	SW319	21/09/2020	0089_SW319_200921	Normal	EP2010083	<0.01	<0.01	<0.01	123	123	552	692	17,400	11.3	2,810	454	1,590	654	12,000
	SW319	14/12/2020	0089_QC111_201214	Field Duplicate	EP2013989	<0.01	<0.01	<0.01	118	118	636	743	20,300	7.72	2,950	523	1,670	715	12,900
	SW319	14/12/2020	0089_QC211_201114	Interlab Duplicate	765054	<0.01	<0.05	<0.1	150	150			20,000						
	SW319	14/12/2020	0089_SW319_201214	Normal	EP2013989	<0.01	<0.01	<0.01	161	161	641	737	20,400	7.00	2,990	520	1,660	706	12,800
	SW319	15/03/2021	0089_QC107_210315	Field Duplicate	EP2102758	<0.01	<0.01	<0.01	113	113	583	708	18,500	9.69	2,820	488	1,550	649	12,400
	SW319	15/03/2021	0089_QC207_210315	Interlab Duplicate	781350	<0.01	<0.05	<0.1	130				19,000						
	SW319	15/03/2021	0089_SW319_210315	Normal	EP2102758	<0.01	<0.01	<0.01	111	111	642	659	20,600	1.35	2,800	432	1,300	677	11,800
	SW319	10/06/2021	0089_SW319_210610	Normal	EP2106582	<0.01	<0.01	<0.01	115	115	581	669	18,600	7.03	2,600	468	1,520	626	11,600
	SW319	31/08/2021	0089_SW319_210831	Normal	EP2110068	<0.01	<0.01	<0.01	119	119	549	581	17,600	2.83	2,410	420	1,300	536	10,100
	SW319	13/01/2022	0089_SW319_220113	Normal	EP2200343	<0.01	<0.01	<0.01	122	122	620	669	20,000	3.84	2,550	452	1,500	559	11,700
	SW319	16/03/2022	0089_SW319_220316	Normal	EP2203058	<0.01	<0.01	<0.01	123	123	622	629	20,000	0.51	2,680	436	1,430	598	10,900
	SW319	9/06/2022	0089_SW319_220609	Normal	EP2207029	<0.01	<0.01	<0.01	122	122	564	625	17,900	5.13	2,720	453	1,480	593	10,700
	SW319	6/09/2022	0089_SW319_220906	Normal	EP2211391	<0.01	<0.01	<0.01	120	120	556	618	17,800	5.27	2,480	426	1,390	494	10,800
Waste Water Treatment Plant	SW353	19/04/2018	0089_SW353_180419	Normal	209623														
	SW353	30/01/2020	0089_SW353_200130	Normal	EP2001004	*0.52*	0.53	0.53	118	118	625	684	20,000	4.52	2,810	473	1,510	560	12,000
	SW353	2/04/2020	0089_SW353_200402	Normal	EP2003473	<0.01	<0.01	<0.01	117	117	586	675	18,600	7.05	2,840	491	1,550	722	11,600
	SW353	21/07/2020	0089_SW353_200721	Normal	EP2007595	<0.01	<0.01	<0.01	123	123	578	667	18,400	7.08	2,740	471	1,490	627	11,600
	SW353	23/09/2020	0089_SW353_200923	Normal	EP2010222	0.02	0.02	0.02	122	122	629	722	20,100	6.92	2,850	515	1,640	698	12,500
	SW353	16/12/2020	0089_SW353_201216	Normal	EP2014090	<0.01	<0.01	<0.01	121	121	625	655	20,000	2.32	2,810	480	1,500	621	11,300
	SW353	17/03/2021	0089_SW353_210317	Normal	EP2102901	<0.01	<0.01	<0.01	112	112	637	673	20,400	2.75	2,850	474	1,500	667	11,700
	SW353	8/06/2021	0089_SW353_210608	Normal	EP2106450	<0.01	<0.01	<0.01	104	104	565	665	17,900	8.10	2,800	458	1,480	618	11,600
	SW353	30/08/2021	0089_SW353_210830	Normal	EP2110017	<0.01	<0.01	<0.01	116	116	550	588	17,600	3.40	2,450	424	1,320	586	10,200
	SW353	11/01/2022	0089_SW353_220111	Normal	EP2200240	<0.01	<0.01	<0.01	121	121	611	631	19,700	1.59	2,560	424	1,390	500	11,100
	SW353	14/03/2022	0089_SW353_220314	Normal	EP2202980	<0.01	<0.01	<0.01	120	120	580	635	18,500	4.48	2,700	448	1,450	580	11,000
	SW353	7/06/2022	0089_SW353_220607	Normal	EP2206884	<0.01	<0.01	<0.01	125	125	528	642	16,800	9.78	2,470	490	1,500	624	11,000
	SW353	7/09/2022	0089_SW353_220907	Normal	EP2211496	<0.01	<0.01	<0.01	120	120	521	635	16,600	9.86	2,430	442	1,430	500	11,100
Waste Water Treatment Plant	SW370	17/04/2018	0089_SW370_180417	Normal	209522														
	SW370	9/01/2020	0089_SW370_200109	Normal	EP2000249	0.02	0.05	0.05	126	128	607	729	19,400	9.10	2,750	516	1,650	746	12,600
	SW370	31/03/2020	0089_SW370_200331	Normal	EP2003372	0.03	0.03	0.03	122	122	585	680	18,600	7.53	2,780	487	1,570	700	11,700
	SW370	15/07/2020	0089_SW370_200715	Normal	EP2007383	<0.01	<0.01	<0.01	130	130	595	716	19,000	9.26	2,710	506	1,540	642	12,600
	SW370	24/09/2020	0089_SW370_200924	Normal	EP2010274	*0.08*	0.08	0.08	150	150	609	684	19,400	5.81	2,830	470	1,490	634	12,000
	SW370	15/12/2020	0089_SW370_201215	Normal	EP2014053	0.05	0.05	0.05	147	147	624	744	19,800	8.81	2,990	544	1,670	726	12,900
	SW370	16/03/2021	0089_SW370_210316	Normal	EP2102834	0.01	0.01	0.01	119	119	637	671	20,400	2.62	2,840	474	1,490	626	11,700
	SW370	9/06/2021	0089_SW370_210609	Normal	EP2106517	0.03	0.03	0.03	166	166	580	670	18,500	7.19	2,620	480	1,520	624	11,600
	SW370	1/09/2021	0089_SW370_210901	Normal	EP2110154	<0.01	<0.01	<0.01	122	122	546	626	17,600	6.84	2,250	440	1,400	572	10,900
	SW370	10/01/2022	0089_SW370_220110	Normal	EP2200215	0.04	0.04	0.04	128	128	609	591	19,600	1.53	2,580	421	1,260	535	10,400
	SW370	14/03/2022	0089_SW370_220314	Normal	EP2202977	0.02	0.02	0.02	124	124	640	685	20,600	3.42	2,700	475	1,550	632	11,900
	SW370	7/06/2022	0089_SW370_220607	Normal	EP2206884	*0.13*	0.13	0.13	126	126	565	582	18,100	1.54	2,480	444	1,350	555	10,000
	SW370	5/09/2022	0089_SW370_220905	Normal	EP2211341	0.02	0.02	0.02	123	123	566	604	18,100	3.28	2,520	416	1,350	598	10,500
Waste Water Treatment Plant	SW371	17/04/2018	0089_SW371_180417	Normal	209522														
	SW371	8/01/2020	0089_SW371_200108	Normal	EP2000183	0.01	0.01	0.01	113	113	591	683	18,700	7.24	2,930	467	1,500	559	12,000
	SW371	1/04/2020	0089_SW371_200401	Normal	EP2003414	<0.01	<0.01	<0.01	130	130	576	652	18,300	6.18	2,770	464	1,510	700	11,200
	SW371	20/07/2020	0089_SW371_200720	Normal	EP2007545	0.01	0.01	0.01	127	127	575	651	18,400	6.20	2,550	451	1,430	571	11,400
	SW371	22/09/2020	0089_SW371_200922	Normal	EP2010145	0.01	0.01	0.01	149	149	588	546	18,800	3.71	2,650	398	1,240	524	9,450
	SW371	15/12/2020	0089_SW371_201215	Normal	EP2014048	*0.31*	0.31	0.31	140	140	608	682	19,400	5.78	2,770	501	1,540	677	11,800
	SW371	15/03/2021	0089_QC103_210315	Field Duplicate	EP2102758	*0.26*	0.26	0.26	119	119	639	632	20,500	0.50	2,790	390	1,270	658	11,300
	SW371	15/03/2021	0089_QC203_210315	Interlab Duplicate	781350	*0.12*	0.12	0.12	140				19,000						
	SW371	15/03/2021	0089_SW371_210315	Normal	EP2102758	*0.24*	0.24	0.24	186	186	644	655	20,600	0.86	2,820	409	1,320	657	11,700
	SW371	10/06/2021	0089_SW371_210610	Normal	EP2106590	<0.01	<0.01	<0.01	129	129	566	647	18,000	6.70	2,670	472	1,460	636	11,200
	SW371	1/09/2021	0089_SW371_210901	Normal	EP2110154	<0.01	<0.01	<0.01	119	119	545	620	17,600	6.45	2,220	433	1,390	567	10,800
	SW371	11/01/2022	0089_SW371_220111	Normal	EP2200240	0.06	0.06	0.06	127	127	592	637	19,000	3.68	2,550	430	1,400	505	11,200
	SW371	18/03/2022	0089_SW371_220318	Normal	EP2203195	<0.01	<0.01	<0.01	128	128	598	638	19,100	3.28	2,710	462	1,440	544	11,100
	SW371	8/06/2022	0089_SW371_220608	Normal	EP2206973	*0.20*	0.20	0.20	132	132	602	659	19,200	4.50	2,780	477	1,550	624	11,300
	SW371	5/09/2022	0089_SW371_220905	Normal	EP2211344	<0.01	<0.01	<0.01	169	169	548	561	17,500	1.21	2,430	400	1,260	555	9,730

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Table 3 - Surface Water Analytical Results

					PFAS			Inorganics										
					Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
					µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.002	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water					*0.07*													
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water					**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Waste Water Treatment Plant	SW372	13/04/2018	0089_SW372_180413	Normal	209417													
	SW372	8/01/2020	0089_SW372_200108	Normal	EP2000183	0.02	0.02	0.02	124	124	593	713	18,900	9.17	2,760	487	1,580	580	12,500
	SW372	31/03/2020	0089_SW372_200331	Normal	EP2003372	0.03	0.03	0.03	118	118	588	709	18,700	9.30	2,800	508	1,630	730	12,200
	SW372	20/07/2020	0089_SW372_200720	Normal	EP2007545	0.02	0.02	0.02	129	129	588	686	18,800	7.73	2,630	487	1,510	610	12,000
	SW372	22/09/2020	0089_SW372_200922	Normal	EP2010145	0.03	0.03	0.03	140	140	589	576	18,800	1.04	2,670	418	1,310	556	9,970
	SW372	15/12/2020	0089_SW372_201215	Normal	EP2014044	0.04	0.04	0.04	104	104	524	567	16,600	3.89	2,590	395	1,270	514	9,870
	SW372	17/03/2021	0089_SW372_210317	Normal	EP2102901	0.01	0.01	0.01	113	113	657	739	21,000	5.89	2,990	537	1,660	741	12,800
	SW372	10/06/2021	0089_SW372_210610	Normal	EP2106590	<0.01	<0.01	<0.01	162	162	566	677	18,100	8.95	2,490	496	1,530	675	11,700
	SW372	1/09/2021	0089_SW372_210901	Normal	EP2110154	<0.01	<0.01	<0.01	120	120	542	628	17,500	7.33	2,220	445	1,420	580	10,900
	SW372	12/01/2022	0089_QC116_220112	Field Duplicate	EP2200289	0.03	0.03	0.03	123	124	604	652	19,200	3.78	2,880				
	SW372	12/01/2022	0089_QC216_220112	Interlab Duplicate	855202	0.02	<0.05	<0.1											
	SW372	12/01/2022	0089_SW372_220112	Normal	EP2200289	0.03	0.03	0.03	120	120	610	718	19,600	8.17	2,610	515	1,570	594	12,600
	SW372	18/03/2022	0089_SW372_220318	Normal	EP2203195	0.05	0.05	0.05	127	127	609	650	19,500	3.29	2,700	474	1,470	550	11,300
	SW372	8/06/2022	0089_SW372_220608	Normal	EP2206973	*0.11*	0.11	0.11	121	121	596	671	18,900	5.90	2,900	483	1,580	636	11,500
	SW372	6/09/2022	0089_SW372_220906	Normal	EP2211391	*0.08*	0.08	0.08	128	128	544	578	17,400	3.09	2,420	406	1,300	465	10,100
Waste Water Treatment Plant	SW373	13/04/2018	0089_SW373_180413	Normal	209417													
	SW373	8/01/2020	0089_SW373_200108	Normal	EP2000183	0.02	0.02	0.02	111	121	583	669	18,600	6.87	2,680	466	1,490	551	11,700
	SW373	31/03/2020	0089_SW373_200331	Normal	EP2003372	0.03	0.03	0.03	117	117	610	711	19,500	7.67	2,760	504	1,620	691	12,300
	SW373	20/07/2020	0089_SW373_200720	Normal	EP2007545	<0.01	<0.01	<0.01	124	124	591	691	18,900	7.81	2,660	480	1,520	615	12,100
	SW373	22/09/2020	0089_SW373_200922	Normal	EP2010145	*0.56*	0.59	0.59	144	144	579	553	18,500	2.30	2,620	400	1,240	534	9,600
	SW373	15/12/2020	0089_SW373_201215	Normal	EP2014044	0.05	0.05	0.05	92	92	500	552	15,600	4.92	2,790	379	1,220	496	9,650
	SW373	17/03/2021	0089_SW373_210317	Normal	EP2102901	0.04	0.04	0.04	112	112	631	714	20,100	6.17	2,990	504	1,600	715	12,400
	SW373	10/06/2021	0089_MW373_210610	Normal	EP2106579	0.02	0.02	0.02	151	151	576	676	18,400	7.97	2,600	486	1,540	629	11,700
	SW373	30/08/2021	0089_SW373_210830	Normal	EP2110017	*0.40*	0.40	0.40	134	134	516	562	16,500	4.24	2,320	412	1,270	559	9,720
	SW373	12/01/2022	0089_SW373_220112	Normal	EP2200289	0.05	0.05	0.05	117	122			19,500		2,650	484	1,490	562	11,800
	SW373	18/03/2022	0089_SW373_220318	Normal	EP2203195	*0.12*	0.12	0.12	126	126	594	575	18,900	1.65	2,800	420	1,310	495	9,960
	SW373	8/06/2022	0089_SW373_220608	Normal	EP2206973	<0.01	<0.01	<0.01	121	121	592	664	18,800	5.72	2,860	478	1,560	627	11,400
	SW373	6/09/2022	0089_SW373_220906	Normal	EP2211391	*0.09*	0.09	0.09	127	127	549	613	17,500	5.53	2,530	430	1,380	497	10,700
Waste Water Treatment Plant	SW382	19/04/2018	0089_SW382_180419	Normal	209623													
	SW382	30/01/2020	0089_SW382_200130	Normal	EP2001004	<0.01	<0.01	<0.01	104	104	622	683	19,900	4.67	2,830	474	1,500	559	12,000
	SW382	2/04/2020	0089_SW382_200402	Normal	EP2003473	<0.01	<0.01	<0.01	116	116	637	730	20,400	6.81	2,850	512	1,670	749	12,600
	SW382	21/07/2020	0089_SW382_200721	Normal	EP2007595	<0.01	<0.01	<0.01	123	123	568	655	18,000	7.12	2,760	460	1,460	616	11,400
	SW382	23/09/2020	0089_SW382_200923	Normal	EP2010218	<0.01	<0.01	<0.01	124	124	613	670	19,600	4.45	2,760	475	1,520	647	11,600
	SW382	16/12/2020	0089_SW382_201216	Normal	EP2014104	<0.01	<0.01	<0.01	118	118	626	716	20,000	6.71	2,840	504	1,620	698	12,400
	SW382	17/03/2021	0089_SW382_210317	Normal	EP2102892	<0.01	<0.01	<0.01	110	110	634	547	20,200	7.29	2,960	392	1,210	506	9,550
	SW382	8/06/2021	0089_SW382_210608	Normal	EP2106450	<0.01	<0.01	<0.01	114	114	568	669	18,000	8.15	2,810	458	1,480	619	11,700
	SW382	30/08/2021	0089_SW382_210830	Normal	EP2110017	*0.17*	0.17	0.17	120	120	550	600	17,600	4.34	2,480	434	1,350	600	10,400
	SW382	11/01/2022	0089_SW382_220111	Normal	EP2200240	<0.01	<0.01	<0.01	115	115	615	637	19,800	1.75	2,590	429	1,400	505	11,200
	SW382	14/03/2022	0089_SW382_220314	Normal	EP2202980	<0.01	<0.01	<0.01	120	120	581	685	18,600	8.20	2,600	476	1,550	628	11,900
	SW382	7/06/2022	0089_SW382_220607	Normal	EP2206881	<0.01	<0.01	<0.01	123	123	558	568	17,900	0.90	2,440	458	1,310	567	9,730
	SW382	7/09/2022	0089_SW382_220907	Normal	EP2211496	<0.01	<0.01	<0.01	119	119	531	634	16,900	8.86	2,490	435	1,420	502	11,100
Waste Water Treatment Plant	SW383	19/04/2018	0089_SW383_180419	Normal	209623													
	SW383	30/01/2020	0089_SW383_200130	Normal	EP2001004	<0.01	<0.01	<0.01	117	117	620	653	19,800	2.60	2,820	455	1,460	544	11,400
	SW383	2/04/2020	0089_SW383_200402	Normal	EP2003473	<0.01	<0.01	<0.01	116	116	640	707	20,500	4.99	2,840	493	1,620	716	12,200
	SW383	21/07/2020	0089_SW383_200721	Normal	EP2007595	<0.01	<0.01	<0.01	123	123	576	694	18,300	9.26	2,770	485	1,540	654	12,100
	SW383	23/09/2020	0089_SW383_200923	Normal	EP2010222	0.02	0.02	0.02	120	120	632	681	20,200	3.70	2,880	482	1,540	655	11,800
	SW383	16/12/2020	0089_SW383_201216	Normal	EP2014090	<0.01	<0.01	<0.01	107	107	626	655	20,000	2.22	2,890	484	1,500	621	11,300
	SW383	17/03/2021	0089_SW383_210317	Normal	EP2102892	<0.01	<0.01	<0.01	119	119	624	568	19,900	4.76	2,920	406	1,250	532	9,910
	SW383	8/06/2021	0089_SW383_210608	Normal	EP2106450	<0.01	<0.01	<0.01	114	114	568	672	18,000	8.31	2,810	468	1,500	623	11,700
	SW383	30/08/2021	0089_SW383_210830	Normal	EP2110017	<0.01	<0.01	<0.01	113	113	539	583	17,200	3.90	2,490	420	1,310	583	10,100
	SW383	11/01/2022	0089_SW383_220111	Normal	EP2200240	<0.01	<0.01	<0.01	120	120	615	653	19,800	3.02	2,590	438	1,430	522	11,500
	SW383	7/06/2022	0089_SW383_220607	Normal	EP2206884	<0.01	<0.01	<0.01	124	124	548	641	17,400	7.79	2,650	485	1,490	620	11,000
	SW383	7/09/2022	0089_SW383_220907	Normal	EP2211496	<0.01	<0.01	<0.01	118	118	520	630	16,500	9.58	2,500	437	1,420	501	11,000
	SW384	19/04/2018	0089_SW384_180419	Normal	209623													
	SW384	30/01/2020	0089_SW384_200130	Normal	EP2001004	0.01	0.01	0.01	118	118	628	672	20,100	3.41	2,820	464	1,480	555	11,800
	SW384	2/04/2020	0089_SW384_200402	Normal	EP2003473	<0.01	<0.01	<0.01	116	116	587	710	18,600	9.51	2,870	517	1,630	762	12,200
	SW384	21/07/2020	0089_SW384_200721	Normal	EP2007595	<0.01	<0.01	<0.01	124	124	572	655	18,200	6.69	2,720	459	1,460	613	11,400

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Table 3 - Surface Water Analytical Results

						PFAS			Inorganics										
						Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.002	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water						*0.07*													
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water						**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Waste Water Treatment Plant	SW384	23/09/2020	0089_SW384_200923	Normal	EP2010222	0.01	0.01	0.01	123	123	626	687	20,000	4.68	2,850	489	1,560	663	11,900
	SW384	16/12/2020	0089_SW384_201216	Normal	EP2014090	<0.01	<0.01	<0.01	117	117	626	690	20,000	4.91	2,850	511	1,590	647	11,900
	SW384	17/03/2021	0089_SW384_210317	Normal	EP2102901	<0.01	<0.01	<0.01	113	113	649	724	20,800	5.50	2,880	512	1,610	716	12,600
	SW384	8/06/2021	0089_SW384_210608	Normal	EP2106450	<0.01	<0.01	<0.01	113	113	562	654	17,800	7.58	2,770	454	1,460	608	11,400
	SW384	30/08/2021	0089_SW384_210830	Normal	EP2110017	0.02	0.02	0.02	118	118	556	584	17,800	2.44	2,480	421	1,320	586	10,100
	SW384	11/01/2022	0089_SW384_220111	Normal	EP2200240	<0.01	<0.01	<0.01	119	119	608	626	19,500	1.46	2,660	421	1,380	498	11,000
	SW384	14/03/2022	0089_SW384_220314	Normal	EP2202980	<0.01	<0.01	<0.01	121	121	583	691	18,600	8.46	2,680	482	1,560	634	12,000
	SW384	7/06/2022	0089_SW384_220607	Normal	EP2206884	<0.01	<0.01	<0.01	123	123	605	605	19,200	0.03	2,910	452	1,400	581	10,400
	SW384	7/09/2022	0089_SW384_220907	Normal	EP2211496	<0.01	<0.01	<0.01	122	122	527	629	16,800	8.83	2,420	433	1,410	493	11,000
Helicopter Support Facility	SW406	14/01/2020	0089_SW406_200114	Normal	EP2000422	<0.01	<0.01	<0.01	126	126	601	689	17,800	6.80	4,650	546	1,610	633	11,800
	SW406	1/04/2020	0089_SW406_200401	Normal	EP2003420	<0.01	<0.01	<0.01	117	117	598	686	19,000	6.90	2,850	486	1,580	731	11,800
	SW406	22/07/2020	0089_QC113_200722	Field Duplicate	EP2007649	<0.01	<0.01	<0.01	148	148	575	649	18,300	6.04	2,690	435	1,390	502	11,500
	SW406	22/07/2020	0089_QC213_200722	Interlab Duplicate	734409	<0.01	<0.05	<0.1	120	120			20,000						
	SW406	22/07/2020	0089_SW406_200722	Normal	EP2007649	<0.01	<0.01	<0.01	122	122	590	650	18,800	4.86	2,740	435	1,400	504	11,500
	SW406	21/09/2020	0089_QC111_200921	Field Duplicate	EP2010083	<0.01	<0.01	<0.01	138	138	551	673	17,300	9.97	2,910	475	1,510	648	11,700
	SW406	21/09/2020	0089_QC211_200921	Interlab Duplicate	746269	<0.01	<0.05	<0.1	110	110			18,000						
	SW406	21/09/2020	0089_SW406_200921	Normal	EP2010083	<0.01	<0.01	<0.01	131	131	560	697	17,600	10.9	2,910	500	1,560	671	12,100
	SW406	15/12/2020	0089_SW406_201215	Normal	EP2014048	<0.01	<0.01	<0.01	137	137	620	676	19,800	4.30	2,820	495	1,520	667	11,700
	SW406	15/03/2021	0089_SW406_210315	Normal	EP2102756	0.02	0.02	0.02	116	116	592	686	18,800	7.40	2,840	475	1,510	640	12,000
	SW406	10/06/2021	0089_SW406_210610	Normal	EP2106590	<0.01	<0.01	<0.01	112	112	584	692	18,600	8.50	2,740	494	1,560	680	12,000
	SW406	31/08/2021	0089_SW406_210831	Normal	EP2110065	<0.01	0.16	0.16	123	123	545	576	17,500	2.77	2,360	406	1,310	518	10,000
	SW406	14/01/2022	0089_SW406_220114	Normal	EP2200400	<0.01	<0.01	<0.01	126	126	621	658	20,000	2.87	2,630	459	1,460	582	11,500
	SW406	16/03/2022	0089_SW406_220316	Normal	EP2203058	<0.01	<0.01	<0.01	123	123	613	636	19,500	1.85	2,910	442	1,460	608	11,000
	SW406	7/06/2022	0089_SW406_220607	Normal	EP2206887	<0.01	<0.01	<0.01	122	122	604	594	19,200	0.86	2,900	445	1,380	575	10,200
	SW406	7/09/2022	0089_SW406_220907	Normal	EP2211496	<0.01	<0.01	<0.01	120	120	525	612	16,700	7.62	2,480	423	1,370	485	10,700
Helicopter Support Facility	SW408	14/01/2020	0089_SW408_200114	Normal	EP2000422	<0.01	<0.01	<0.01	134	134	598	694	19,100	7.42	2,730	498	1,570	708	12,000
	SW408	1/04/2020	0089_SW408_200401	Normal	EP2003420	<0.01	<0.01	<0.01	119	119	601	691	19,200	7.03	2,720	482	1,560	666	12,000
	SW408	22/07/2020	0089_SW408_200722	Normal	EP2007649	<0.01	<0.01	<0.01	122	122	585	650	18,600	5.28	2,780	437	1,400	506	11,500
	SW408	21/09/2020	0089_SW408_200921	Normal	EP2010083	<0.01	<0.01	<0.01	134	134	554	703	17,400	11.9	2,900	500	1,580	682	12,200
	SW408	15/12/2020	0089_SW408_201215	Normal	EP2014053	<0.01	<0.01	<0.01	142	142	610	660	19,300	4.01	2,990	488	1,500	657	11,400
	SW408	15/03/2021	0089_SW408_210315	Normal	EP2102756	<0.01	<0.01	<0.01	118	118	597	709	19,000	8.60	2,810	489	1,560	664	12,400
	SW408	10/06/2021	0089_SW408_210610	Normal	EP2106590	<0.01	<0.01	<0.01	135	135	578	652	18,500	6.04	2,560	468	1,470	638	11,300
	SW408	31/08/2021	0089_SW408_210831	Normal	EP2110072	<0.01	0.06	0.06	126	126	554	662	17,700	8.88	2,510	478	1,490	600	11,500
	SW408	14/01/2022	0089_SW408_220114	Normal	EP2200400	<0.01	<0.01	<0.01	124	124	621	648	20,000	2.17	2,600	455	1,450	578	11,300
	SW408	16/03/2022	0089_SW408_220316	Normal	EP2203058	<0.01	<0.01	<0.01	122	122	622	675	19,800	4.09	2,950	466	1,540	648	11,700
	SW408	7/06/2022	0089_SW408_220607	Normal	EP2206887	<0.01	<0.01	<0.01	124	124	548	627	17,300	6.73	2,780	458	1,460	575	10,800
	SW408	7/09/2022	0089_SW408_220907	Normal	EP2211498	<0.01	<0.01	<0.01	122	122	563	601	18,000	3.25	2,530	416	1,350	473	10,500
Helicopter Support Facility	SW410	14/01/2020	0089_SW410_200114	Normal	EP2000422	<0.01	<0.01	<0.01	179	179	608	723	19,400	8.63	2,740	519	1,630	741	12,500
	SW410	2/04/2020	0089_SW410_200402	Normal	EP2003471	<0.01	<0.01	<0.01	116	116	608	714	19,400	7.98	2,820	510	1,590	706	12,400
	SW410	21/07/2020	0089_SW410_200721	Normal	EP2007604	<0.01	<0.01	<0.01	127	127	569	658	18,200	7.22	2,560	520	1,440	686	11,400
	SW410	22/09/2020	0089_SW410_200922	Normal	EP2010145	<0.01	<0.01	<0.01	130	130	612	647	19,600	2.73	2,740	474	1,460	624	11,200
	SW410	15/12/2020	0089_SW410_201215	Normal	EP2014044	<0.01	<0.01	<0.01	141	141	614	689	19,600	5.71	2,820	484	1,540	627	12,000
	SW410	17/03/2021	0089_SW410_210317	Normal	EP2102901	<0.01	<0.01	<0.01	112	112	656	755	21,000	7.01	2,960	540	1,690	758	13,100
	SW410	10/06/2021	0089_QC114_210610	Field Duplicate	EP2106590	<0.01	<0.01	<0.01	114	114	575	647	18,400	5.87	2,590	469	1,460	635	11,200
	SW410	10/06/2021	0089_QC214_210610	Interlab Duplicate	802734	<0.01	<0.05	<0.1	120	120			20,000						
	SW410	10/06/2021	0089_SW410_210610	Normal	EP2106590	<0.01	<0.01	<0.01	110	110	579	675	18,500	7.71	2,620	488	1,520	660	11,700
	SW410	31/08/2021	0089_SW410_210831	Normal	EP2110065	<0.01	<0.01	<0.01	124	124	547	585	17,500	3.38	2,450	412	1,310	522	10,200
	SW410	14/01/2022	0089_SW410_220114	Normal	EP2200400	<0.01	<0.01	<0.01	126	126	636	647	20,500	0.92	2,630	452	1,440	576	11,300
	SW410	16/03/2022	0089_SW410_220316	Normal	EP2203058	<0.01	<0.01	<0.01	125	125	600	640	19,000	3.28	2,950	443	1,460	606	11,100
	SW410	7/06/2022	0089_SW410_220607	Normal	EP2206887	<0.01	<0.01	<0.01	120	120	561	640	17,900	6.56	2,580	460	1,500	585	11,000
	SW410	6/09/2022	0089_SW410_220906	Normal	EP2211391	<0.01	<0.01	<0.01	120	120	536	608	17,100	6.26	2,470	427	1,370	494	10,600
Helicopter Support Facility	SW412	14/01/2020	0089_SW412_200114	Normal	EP2000422	<0.01	<0.01	<0.01	115	115	603	720	19,200	8.82	2,860	504	1,610	735	12,500
	SW412	1/04/2020	0089_SW412_200401	Normal	EP2003418	<0.01	<0.01	<0.01	117	117	594	681	18,900	6.84	2,800	488	1,570	726	11,700
	SW412	21/07/2020	0089_SW412_200721	Normal	EP2007604	0.01	0.01	0.01	122	122	573	656	18,200	6.81	2,740	514	1,430	679	11,400
	SW412	22/09/2020	0089_SW412_200922	Normal	EP2010145	<0.01	<0.01	<0.01	140	140	608	625	19,400	1.42	2,770	462	1,420	607	10,800
	SW412	15/12/2020	0089_SW412_201215	Normal	EP2014044	<0.01	<0.01	<0.01	119	119	600	712	19,100	8.52	2,820	494	1,590	652	12,400
	SW412	18/03/2021	0089_SW412_210318	Normal	EP2102956	<0.01	<0.01	<0.01	111	111	625	638	20,100	0.97	2,700	443	1,430	589	11,100

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Table 3 - Surface Water Analytical Results

						PFAS			Inorganics										
						Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.002	0.001	0.001	1	1	0.01	0.01	1	0.01	1	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Drinking Water						*0.07*													
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water						**2**													
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**														
Helicopter Support Facility	SW412	9/06/2021	0089_SW412_210609	Normal	EP2106517	<0.01	<0.01	<0.01	116	116	584	714	18,600	9.97	2,760	482	1,590	600	12,500
	SW412	1/09/2021	0089_SW412_210901	Normal	EP2110155	<0.01	<0.01	<0.01	118	118	549	631	17,700	6.98	2,260	437	1,410	578	11,000
	SW412	14/01/2022	0089_SW412_220114	Normal	EP2200400	<0.01	<0.01	<0.01	119	119	645	658	20,800	1.04	2,670	456	1,460	589	11,500
	SW412	16/03/2022	0089_SW412_220316	Normal	EP2203058	<0.01	<0.01	<0.01	123	123	599	670	19,100	5.62	2,770	464	1,530	648	11,600
	SW412	7/06/2022	0089_SW412_220607	Normal	EP2206887	<0.01	<0.01	<0.01	122	122	540	616	17,200	6.55	2,530	443	1,440	560	10,600
	SW412	6/09/2022	0089_SW412_220906	Normal	EP2211401	<0.01	<0.01	<0.01	119	119	588	624	18,900	2.93	2,540	438	1,400	496	10,900
Helicopter Support Facility	SW414	14/01/2020	0089_SW414_200114	Normal	EP2000422	<0.01	<0.01	<0.01	119	119	618	728	19,300	8.14	3,430	515	1,640	747	12,600
	SW414	2/04/2020	0089_SW414_200402	Normal	EP2003473	<0.01	<0.01	<0.01	114	114	592	687	18,800	7.44	2,850	497	1,580	744	11,800
	SW414	21/07/2020	0089_SW414_200721	Normal	EP2007604	<0.01	<0.01	<0.01	124	124	573	672	18,200	7.96	2,740	471	1,500	634	11,700
	SW414	22/09/2020	0089_SW414_200922	Normal	EP2010145	<0.01	<0.01	<0.01	119	119	608	584	19,400	1.99	2,780	426	1,320	569	10,100
	SW414	15/12/2020	0089_SW414_201215	Normal	EP2014044	<0.01	<0.01	<0.01	124	124	605	654	19,200	3.90	2,930	457	1,460	602	11,400
	SW414	18/03/2021	0089_SW414_210318	Normal	EP2102941	0.04	0.04	0.04	107	107	601	642	19,200	3.32	2,760	448	1,430	598	11,200
	SW414	9/06/2021	0089_SW414_210609	Normal	EP2106517	<0.01	<0.01	<0.01	114	114	583	710	18,700	9.81	2,580	503	1,620	665	12,300
	SW414	1/09/2021	0089_SW414_210901	Normal	EP2110155	<0.01	<0.01	<0.01	116	116	547	621	17,600	6.36	2,310	433	1,400	572	10,800
	SW414	14/01/2022	0089_SW414_220114	Normal	EP2200400	<0.01	<0.01	<0.01	121	121	630	642	20,300	0.88	2,660	446	1,430	569	11,200
	SW414	16/03/2022	0089_SW414_220316	Normal	EP2203058	<0.01	<0.01	<0.01	126	126	610	623	19,400	1.08	2,890	431	1,420	592	10,800
	SW414	7/06/2022	0089_QC116_220607	Field Duplicate	EP2206887	<0.01	<0.01	<0.01											
	SW414	7/06/2022	0089_QC216_220607	Interlab Duplicate	896805	<0.002	<0.001	<0.001											
	SW414	7/06/2022	0089_SW414_220607	Normal	EP2206887	<0.01	<0.01	<0.01	120	120	547	600	17,300	4.63	2,700	434	1,410	546	10,300
	SW414	6/09/2022	0089_SW414_220906	Normal	EP2211401	<0.01	<0.01	<0.01	119	119	575	602	18,400	2.28	2,580	420	1,360	481	10,500
Helicopter Support Facility	SW416	14/01/2020	0089_SW416_200114	Normal	EP2000422	<0.01	<0.01	<0.01	118	118	615	689	19,400	5.69	3,140	486	1,570	710	11,900
	SW416	2/04/2020	0089_SW416_200402	Normal	EP2003473	<0.01	<0.01	<0.01	118	118	648	730	20,800	5.97	2,830	511	1,670	753	12,600
	SW416	21/07/2020	0089_SW416_200721	Normal	EP2007604	<0.01	<0.01	<0.01	122	122	577	662	18,400	6.86	2,680	470	1,490	628	11,500
	SW416	22/09/2020	0089_SW416_200922	Normal	EP2010145	<0.01	<0.01	<0.01	126	126	613	619	19,600	0.43	2,780	454	1,400	600	10,700
	SW416	15/12/2020	0089_SW416_201215	Normal	EP2014044	<0.01	<0.01	<0.01	126	126	621	712	19,800	6.77	2,900	495	1,590	654	12,400
	SW416	18/03/2021	0089_SW416_210318	Normal	EP2102941	<0.01	<0.01	<0.01	114	114	631	655	20,200	1.88	2,840	461	1,470	608	11,400
	SW416	9/06/2021	0089_SW416_210609	Normal	EP2106517	<0.01	<0.01	<0.01	118	118	568	692	18,200	9.87	2,500	492	1,570	645	12,000
	SW416	1/09/2021	0089_SW416_210901	Normal	EP2110155	<0.01	<0.01	<0.01	118	118	558	604	18,000	3.94	2,300	424	1,360	548	10,500
	SW416	14/01/2022	0089_SW416_220114	Normal	EP2200400	<0.01	<0.01	<0.01	120	120	627	647	20,200	1.59	2,640	454	1,440	578	11,300
	SW416	16/03/2022	0089_SW416_220316	Normal	EP2203058	<0.01	<0.01	<0.01	116	116	603	682	19,200	6.14	2,840	473	1,560	653	11,800
	SW416	7/06/2022	0089_SW416_220607	Normal	EP2206887	<0.01	<0.01	<0.01	123	123	559	624	17,800	5.56	2,600	453	1,480	573	10,700
	SW416	6/09/2022	0089_SW416_220906	Normal	EP2211401	<0.01	<0.01	<0.01	118	118	575	619	18,400	3.71	2,580	434	1,400	502	10,800

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First Time detection of PFOA or PFHxS+PFOS
New exceedance of guideline value

Cardno now Stantec

Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids						
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Waste Water Treatment Plant	SD304	17/04/2018	0089_SD304_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD304	8/01/2020	0089_SD304_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	1/04/2020	0089_SD304_0.40-0.50_200401	Normal	EP2003415	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	20/07/2020	0089_SD304_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	22/09/2020	0089_SD304_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	15/12/2020	0089_SD304_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	15/03/2021	0089_SD304_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	10/06/2021	0089_SD304_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	1/09/2021	0089_SD304_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	11/01/2022	0089_SD304_220111	Normal	EP2200242	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	18/03/2022	0089_SD304_220318	Normal	EP2203196	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	8/06/2022	0089_SD304_220608	Normal	EP2206972	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD304	5/09/2022	0089_SD304_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD306	18/04/2018	0089_SD306_180418	Normal	209573	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD306	10/01/2020	0089_SD306_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	31/03/2020	0089_SD306_200331_1.00-1.20_200331	Normal	EP2003368	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	22/07/2020	0089_SD306_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	23/09/2020	0089_SD306_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	15/12/2020	0089_SD306_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	17/03/2021	0089_SD306_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	9/06/2021	0089_SD306_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	31/08/2021	0089_QC115_210831	Field Duplicate	EP2110074	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	31/08/2021	0089_QC215_210831	Interlab Duplicate	821197	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD306	31/08/2021	0089_SD306_210831	Normal	EP2110074	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	13/01/2022	0089_SD306_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	16/03/2022	0089_SD306_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	7/06/2022	0089_SD306_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD306	6/09/2022	0089_SD306_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD307	30/04/2018	0089_SD307_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD307	10/01/2020	0089_SD307_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	31/03/2020	0089_SD307_200331_1.00-1.20_200331	Normal	EP2003368	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	22/07/2020	0089_SD307_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	23/09/2020	0089_SD307_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	15/12/2020	0089_SD307_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	17/03/2021	0089_SD307_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	9/06/2021	0089_SD307_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	31/08/2021	0089_SD307_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	13/01/2022	0089_SD307_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	16/03/2022	0089_SD307_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	7/06/2022	0089_SD307_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD307	6/09/2022	0089_SD307_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD308	30/04/2018	0089_SD308_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD308	10/01/2020	0089_SD308_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	1/04/2020	0089_SD308_1.00-1.20_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	22/07/2020	0089_SD308_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	23/09/2020	0089_SD308_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	15/12/2020	0089_SD308_0.50_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	17/03/2021	0089_QC117_210317	Field Duplicate	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	17/03/2021	0089_QC217_210317	Interlab Duplicate	782088	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD308	17/03/2021	0089_SD308_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	9/06/2021	0089_SD308_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	31/08/2021	0089_SD308_210831	Normal	EP2110074	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	13/01/2022	0089_SD308_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	16/03/2022	0089_SD308_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	7/06/2022	0089_SD308_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD308	6/09/2022	0089_SD308_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD314	18/04/2018	0089_SD314_180418	Normal	209573	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD314	10/01/2020	0089_SD314_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	31/03/2020	0089_SD314_200331_0.60-0.80_200331	Normal	EP2003368	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	22/07/2020	0089_SD314_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	23/09/2020	0089_SD314_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	15/12/2020	0089_SD314_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	17/03/2021	0089_SD314_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	9/06/2021	0089_SD314_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	31/08/2021	0089_SD314_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	13/01/2022	0089_SD314_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	16/03/2022	0089_SD314_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	7/06/2022	0089_QC102_220607	Field Duplicate	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	7/06/2022	0089_QC202_220607	Interlab Duplicate	896805	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002
	SD314	7/06/2022	0089_SD314_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD314	6/09/2022	0089_SD314_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	30/04/2018	0089_SD315_180430	Normal	209959	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005

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Table 4 - Sediment Analytical Results

								PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids						
								Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
								mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting								0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**															
Helicopter Support Facility	SD315	10/01/2020	0089_SD315_200110	Normal	EP2000288			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	1/04/2020	0089_SD315_1.00-1.20_200401	Normal	EP2003416			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	22/07/2020	0089_SD315_200722	Normal	EP2007650			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	23/09/2020	0089_SD315_200923	Normal	EP2010219			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	15/12/2020	0089_SD315_201215	Normal	EP2014049			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	17/03/2021	0089_SD315_210317	Normal	EP2102888			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	9/06/2021	0089_SD315_210609	Normal	EP2106520			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	31/08/2021	0089_SD315_210831	Normal	EP2110074			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	13/01/2022	0089_SD315_220113	Normal	EP2200341			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	16/03/2022	0089_SD315_220316	Normal	EP2203059			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	7/06/2022	0089_SD315_220607	Normal	EP2206886			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD315	6/09/2022	0089_SD315_220906	Normal	EP2211402			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD316	30/04/2018	0089_SD316_180430	Normal	209959			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD316	10/01/2020	0089_SD316_200110	Normal	EP2000288			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	1/04/2020	0089_SD316_1.20-1.40_200401	Normal	EP2003416			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	22/07/2020	0089_SD316_200722	Normal	EP2007650			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	23/09/2020	0089_SD316_200923	Normal	EP2010219			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	15/12/2020	0089_SD316_201215	Normal	EP2014052			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	17/03/2021	0089_SD316_210317	Normal	EP2102888			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	9/06/2021	0089_SD316_210609	Normal	EP2106520			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	31/08/2021	0089_SD316_210831	Normal	EP2110067			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	13/01/2022	0089_SD316_220113	Normal	EP2200341			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	16/03/2022	0089_SD316_220316	Normal	EP2203059			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	7/06/2022	0089_SD316_220607	Normal	EP2206886			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD316	6/09/2022	0089_SD316_220906	Normal	EP2211402			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition Ground	SD329	12/04/2018	0089_SD329_180412	Normal	209345			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD329	10/01/2020	0089_SD329_200110	Normal	EP2000253			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	30/03/2020	0089_SD329_200330_0.50-0.60_200330	Normal	EP2003310			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	20/07/2020	0089_SD329_200720	Normal	EP2007546			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	23/09/2020	0089_SD329_200923	Normal	EP2010219			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	14/12/2020	0089_QC101_201214	Field Duplicate	EP2013974			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	14/12/2020	0089_QC201_201114	Interlab Duplicate	765054			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD329	14/12/2020	0089_SD329_201214	Normal	EP2013974			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	16/03/2021	0089_SD329_210316	Normal	EP2102838			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	8/06/2021	0089_QC104_210608	Field Duplicate	EP2106466			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	8/06/2021	0089_QC204_210608	Interlab Duplicate	802464			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD329	8/06/2021	0089_SD329_210608	Normal	EP2106466			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	30/08/2021	0089_SD329_210830	Normal	EP2110018			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	10/01/2022	0089_QC109_220110	Field Duplicate	EP2200219			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	10/01/2022	0089_QC209_220110	Interlab Duplicate	854607			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD329	10/01/2022	0089_SD329_220110	Normal	EP2200219			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	15/03/2022	0089_QC115_220315	Field Duplicate	EP2203020			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	15/03/2022	0089_QC215_220315	Interlab Duplicate	872903			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD329	15/03/2022	0089_SD329_220315	Normal	EP2203020			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	8/06/2022	0089_SD329_220608	Normal	EP2206968			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD329	5/09/2022	0089_SD329_220905	Normal	EP2211348			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition Ground	SD330	12/04/2018	0089_SD330_180412	Normal	209345			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD330	10/01/2020	0089_SD330_200110	Normal	EP2000253			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	30/03/2020	0089_SD330_200330_0.50-0.60_200330	Normal	EP2003310			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	20/07/2020	0089_SD330_200720	Normal	EP2007546			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	22/09/2020	0089_SD330_200922	Normal	EP2010152			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	14/12/2020	0089_SD330_201214	Normal	EP2013990			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	16/03/2021	0089_SD330_210316	Normal	EP2102838			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	8/06/2021	0089_SD330_210608	Normal	EP2106466			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	30/08/2021	0089_SD330_210830	Normal	EP2110018			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	10/01/2022	0089_SD330_220110	Normal	EP2200219			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	15/03/2022	0089_SD330_220315	Normal	EP2203020			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	8/06/2022	0089_SD330_220608	Normal	EP2206968			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD330	5/09/2022	0089_SD330_220905	Normal	EP2211348			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition Ground	SD331	12/04/2018	0089_SD331_180412	Normal	209345			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD331	10/01/2020	0089_SD331_200110	Normal	EP2000253			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	30/03/2020	0089_SD331_200330_0.30-0.50_200330	Normal	EP2003310			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	20/07/2020	0089_SD331_200720	Normal	EP2007546			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	23/09/2020	0089_SD331_200923	Normal	EP2010221			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	14/12/2020	0089_QC103_201214	Field Duplicate	EP2013974			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	14/12/2020	0089_QC203_201114	Interlab Duplicate	765054			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD331	14/12/2020	0089_SD331_201214	Normal	EP2013974			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	16/03/2021	0089_SD331_210316	Normal	EP2102838			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	8/06/2021	0089_SD331_210608	Normal	EP2106466			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	30/08/2021	0089_SD331_210830	Normal	EP2110018			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	10/01/2022	0089_SD331_220110	Normal	EP2200219			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	15/03/2022	0089_SD331_220315	Normal	EP2203020			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	8/06/2022	0089_SD331_220608	Normal	EP2206968			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD331	5/09/2022	0089_SD331_220905	Normal	EP2211348			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids						
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Fire Training Area	SD335	13/04/2018	0089_QC1SD_180413	Field Duplicate	209417	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD335	13/04/2018	0089_QC2SD_180413	Interlab Duplicate	594110	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	SD335	13/04/2018	0089_SD335_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD335	9/01/2020	0089_SD335_0.40-0.50_200109	Normal	EP2000250	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	30/03/2020	0089_SD335_0.50_200330	Normal	EP2003315	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	15/07/2020	0089_QC101_200715	Field Duplicate	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	15/07/2020	0089_QC201_200215	Interlab Duplicate	732844	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD335	15/07/2020	0089_SD335_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	22/09/2020	0089_SD335_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	14/12/2020	0089_SD335_201214	Normal	EP2013986	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	15/03/2021	0089_SD335_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	8/06/2021	0089_SD335_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	30/08/2021	0089_SD335_210830	Normal	EP2110022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	10/01/2022	0089_QC103_220110	Field Duplicate	EP2200217	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	10/01/2022	0089_QC203_220110	Interlab Duplicate	854607	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD335	10/01/2022	0089_SD335_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	14/03/2022	0089_SD335_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	7/06/2022	0089_QC113_220607	Field Duplicate	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	7/06/2022	0089_QC213_220607	Interlab Duplicate	896805	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002
	SD335	7/06/2022	0089_SD335_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD335	5/09/2022	0089_SD335_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Fire Training Area	SD340	13/04/2018	0089_SD340_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD340	9/01/2020	0089_SD340_0.40-0.50_200109	Normal	EP2000250	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	30/03/2020	0089_QC108_200330	Field Duplicate	EP2003315	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	30/03/2020	0089_QC208_200330	Interlab Duplicate	711144	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD340	30/03/2020	0089_SD340_200330	Normal	EP2003315	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	15/07/2020	0089_SD340_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	22/09/2020	0089_SD340_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	14/12/2020	0089_SD340_201214	Normal	EP2013987	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	15/03/2021	0089_SD340_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	8/06/2021	0089_SD340_210608	Normal	EP2106449	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	30/08/2021	0089_QC107_210830	Field Duplicate	EP2110023	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	30/08/2021	0089_QC207_210830	Interlab Duplicate	820919	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD340	30/08/2021	0089_SD340_210830	Normal	EP2110023	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	10/01/2022	0089_SD340_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	14/03/2022	0089_SD340_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	7/06/2022	0089_SD340_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	5/09/2022	0089_QC105_220905	Field Duplicate	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD340	5/09/2022	0089_QC205_220905	Interlab Duplicate	920981	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD340	5/09/2022	0089_SD340_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Fire Training Area	SD341	13/04/2018	0089_SD341_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD341	8/01/2020	0089_QC105_200108	Field Duplicate	EP2000181	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	8/01/2020	0089_QC205_200108	Interlab Duplicate	696100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD341	8/01/2020	0089_SD341_200108	Normal	EP2000181	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	31/03/2020	0089_SD341_200331	Normal	EP2003365	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	15/07/2020	0089_SD341_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	22/09/2020	0089_SD341_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	14/12/2020	0089_SD341_201214	Normal	EP2013987	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	15/03/2021	0089_SD341_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	8/06/2021	0089_SD341_210608	Normal	EP2106449	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	30/08/2021	0089_SD341_210830	Normal	EP2110022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	10/01/2022	0089_SD341_220110	Normal	EP2200213	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	14/03/2022	0089_SD341_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	7/06/2022	0089_SD341_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD341	5/09/2022	0089_SD341_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD345	13/04/2018	0089_SD345_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD345	9/01/2020	0089_SD345_0.30-0.40_200109	Normal	EP2000250	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	31/03/2020	0089_SD345_0.40-0.50_200331	Normal	EP2003371	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	24/09/2020	0089_SD345_200924	Normal	EP2010272	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	15/12/2020	0089_SD345_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	16/03/2021	0089_SD345_210316	Normal	EP2102835	<0.0002	<0.0002	<0.0002	<0.0002	0.0017	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	9/06/2021	0089_SD345_210609	Normal	EP2106518	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	1/09/2021	0089_SD345_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	10/01/2022	0089_SD345_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	14/03/2022	0089_SD345_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	7/06/2022	0089_SD345_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD345	5/09/2022	0089_SD345_220905	Normal	EP2211342	<0.0002	<0.0002	<0.0002	<0.0002	0.0016	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	17/04/2018	0089_SD346_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0007	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD346	8/01/2020	0089_SD346_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	1/04/2020	0089_SD346_0.30-0.40_200401	Normal	EP2003415	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	15/07/2020	0089_SD346_200715	Normal	EP2007387	<0.0002	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	22/09/2020	0089_SD346_200922	Normal	EP2010144	<0.0002	<0.0002	0.0002	<0.0002	*0.0114*	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	15/12/2020	0089_SD346_201215	Normal	EP2014043	<0.0002	<0.0002	0.0002	<0.0002	0.0094	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	17/03/2021	0089_SD346_210317	Normal	EP2102902	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids						
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Accommodation Area	SD346	10/06/2021	0089_SD346_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0002	0.0028	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	30/08/2021	0089_QC105_210830	Field Duplicate	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	0.0022	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	30/08/2021	0089_QC205_210830	Interlab Duplicate	820919	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD346	30/08/2021	0089_SD346_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	0.0024	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	12/01/2022	0089_QC117_220112	Field Duplicate	EP2200290	<0.0002	<0.0002	<0.0002	<0.0002	0.0070	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	12/01/2022	0089_QC217_220112	Interlab Duplicate	855202	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD346	12/01/2022	0089_SD346_220112	Normal	EP2200290	<0.0002	<0.0002	0.0003	<0.0002	0.0029	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	18/03/2022	0089_SD346_220318	Normal	EP2203196	<0.0002	<0.0002	0.0024	<0.0002	*0.0153*	<0.0002	<0.001	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	8/06/2022	0089_SD346_220608	Normal	EP2206972	<0.0002	<0.0002	<0.0002	<0.0002	0.0019	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD346	6/09/2022	0089_SD346_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0002	0.0025	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD350	19/04/2018	0089_SD350_180419	Normal	209623	<0.0001	<0.0001	<0.0001	<0.0001	0.0005	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD350	30/01/2020	0089_SD350_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	2/04/2020	0089_SD350_200402	Normal	EP2003477	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	21/07/2020	0089_SD350_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	23/09/2020	0089_SD350_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	16/12/2020	0089_SD350_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	17/03/2021	0089_SD350_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	8/06/2021	0089_SD350_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	30/08/2021	0089_SD350_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	11/01/2022	0089_SD350_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	14/03/2022	0089_SD350_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	7/06/2022	0089_SD350_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD350	7/09/2022	0089_SD350_220907	Normal	EP2211497	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD351	19/04/2018	0089_SD351_180419	Normal	209623	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD351	30/01/2020	0089_SD351_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	2/04/2020	0089_SD351_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	21/07/2020	0089_SD351_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	23/09/2020	0089_SD351_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	16/12/2020	0089_SD351_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	17/03/2021	0089_SD351_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	8/06/2021	0089_SD351_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	30/08/2021	0089_SD351_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	11/01/2022	0089_SD351_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	14/03/2022	0089_SD351_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	7/06/2022	0089_SD351_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD351	7/09/2022	0089_SD351_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD352	19/04/2018	0089_SD352_180419	Normal	209623	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD352	30/01/2020	0089_SD352_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	21/07/2020	0089_SD352_200721	Normal	EP2007596	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	23/09/2020	0089_SD352_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	16/12/2020	0089_SD352_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	17/03/2021	0089_SD352_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	8/06/2021	0089_SD352_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	30/08/2021	0089_SD352_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	11/01/2022	0089_SD352_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	14/03/2022	0089_SD352_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	7/06/2022	0089_SD352_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD352	7/09/2022	0089_SD352_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition Ground	SD356	12/04/2018	0089_QC1SD_180412	Field Duplicate	209345	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD356	12/04/2018	0089_QC2SD_180412	Interlab Duplicate	594110	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	SD356	12/04/2018	0089_SD356_180412	Normal	209345	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD356	10/01/2020	0089_SD356_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	30/03/2020	0089_SD356_200330_0.50-0.60_200330	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	20/07/2020	0089_SD356_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	23/09/2020	0089_SD356_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	14/12/2020	0089_SD356_201214	Normal	EP2013974	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	16/03/2021	0089_SD356_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	8/06/2021	0089_SD356_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	30/08/2021	0089_QC109_210830	Field Duplicate	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	30/08/2021	0089_QC209_210830	Interlab Duplicate	820919	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD356	30/08/2021	0089_SD356_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	10/01/2022	0089_SD356_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	15/03/2022	0089_QC112_220315	Field Duplicate	EP2203020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	15/03/2022	0089_QC212_220315	Interlab Duplicate	872903	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD356	15/03/2022	0089_SD356_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	8/06/2022	0089_SD356_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD356	5/09/2022	0089_SD356_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	12/04/2018	0089_SD357_180412	Normal	209345	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD357	10/01/2020	0089_SD357_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	30/03/2020	0089_SD357_200330_0.40-0.60_200330	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	20/07/2020	0089_SD357_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	23/09/2020	0089_SD357_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	14/12/2020	0089_SD357_201214	Normal	EP2013974	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	16/03/2021	0089_SD357_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids						
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Demolition Ground	SD357	8/06/2021	0089_SD357_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	30/08/2021	0089_SD357_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	10/01/2022	0089_SD357_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	15/03/2022	0089_SD357_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	8/06/2022	0089_SD357_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	5/09/2022	0089_QC107_220905	Field Duplicate	EP2211348	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD357	5/09/2022	0089_QC207_220905	Interlab Duplicate	920981	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD357	5/09/2022	0089_SD357_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	12/04/2018	0089_SD358_180412	Normal	209345	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD358	10/01/2020	0089_SD358_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	30/03/2020	0089_SD358_200330_0.50-0.60_200330	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	20/07/2020	0089_SD358_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	23/09/2020	0089_SD358_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	14/12/2020	0089_SD358_0.30_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	16/03/2021	0089_SD358_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition Ground	SD358	8/06/2021	0089_QC108_210608	Field Duplicate	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	8/06/2021	0089_QC208_210608	Interlab Duplicate	802464	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD358	8/06/2021	0089_SD358_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	30/08/2021	0089_SD358_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	10/01/2022	0089_SD358_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	15/03/2022	0089_SD358_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	8/06/2022	0089_SD358_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD358	5/09/2022	0089_SD358_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	13/04/2018	0089_SD362_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD362	8/01/2020	0089_SD362_200108	Normal	EP2000181	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	31/03/2020	0089_SD362_200331	Normal	EP2003365	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	15/07/2020	0089_QC102_200715	Field Duplicate	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	15/07/2020	0089_QC202_200215	Interlab Duplicate	732844	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD362	15/07/2020	0089_SD362_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	22/09/2020	0089_SD362_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Fire Training Area	SD362	14/12/2020	0089_SD362_201214	Normal	EP2013987	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	15/03/2021	0089_SD362_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	8/06/2021	0089_SD362_210608	Normal	EP2106449	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	30/08/2021	0089_SD362_210830	Normal	EP2110023	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	10/01/2022	0089_SD362_220110	Normal	EP2200213	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	14/03/2022	0089_SD362_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	7/06/2022	0089_SD362_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD362	5/09/2022	0089_SD362_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	13/04/2018	0089_SD363_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD363	8/01/2020	0089_SD363_200108	Normal	EP2000181	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	31/03/2020	0089_SD363_200331	Normal	EP2003365	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	15/07/2020	0089_SD363_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	22/09/2020	0089_SD363_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	14/12/2020	0089_SD363_201214	Normal	EP2013987	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	15/03/2021	0089_SD363_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Fire Training Area	SD363	8/06/2021	0089_SD363_210608	Normal	EP2106449	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	30/08/2021	0089_SD363_210830	Normal	EP2110023	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	10/01/2022	0089_SD363_220110	Normal	EP2200213	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	14/03/2022	0089_SD363_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	7/06/2022	0089_SD363_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	5/09/2022	0089_QC112_220905	Field Duplicate	EP2211342	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD363	5/09/2022	0089_QC212_220905	Interlab Duplicate	920981	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD363	5/09/2022	0089_SD363_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	13/04/2018	0089_SD364_180413	Normal	209417	<0.0001	<0.0001	<0.0001	<0.0002	0.0006	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD364	9/01/2020	0089_SD364_0.40-0.50_200109	Normal	EP2000250	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	30/03/2020	0089_QC106_200330	Field Duplicate	EP2003315	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	30/03/2020	0089_QC206_200330	Interlab Duplicate	711144	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD364	30/03/2020	0089_SD364_200330	Normal	EP2003315	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	15/07/2020	0089_SD364_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	22/09/2020	0089_SD364_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Fire Training Area	SD364	14/12/2020	0089_SD364_201214	Normal	EP2013986	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	15/03/2021	0089_SD364_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	8/06/2021	0089_SD364_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	30/08/2021	0089_SD364_210830	Normal	EP2110022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	10/01/2022	0089_SD364_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	14/03/2022	0089_SD364_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	7/06/2022	0089_SD364_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD364	5/09/2022	0089_SD364_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	17/04/2018	0089_SD367_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0011	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD367	8/01/2020	0089_SD367_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	31/03/2020	0089_SD367_0.40-0.50_200331	Normal	EP2003371	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	15/07/2020	0089_SD367_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	22/09/2020	0089_SD367_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	15/12/2020	0089_SD367_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids						
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Waste Water Treatment Plant	SD367	15/03/2021	0089_SD367_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	9/06/2021	0089_SD367_210609	Normal	EP2106518	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	1/09/2021	0089_SD367_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	11/01/2022	0089_QC114_220111	Field Duplicate	EP2200242	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	11/01/2022	0089_QC214_220111	Interlab Duplicate	855202	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD367	11/01/2022	0089_SD367_220111	Normal	EP2200242	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	14/03/2022	0089_QC110_220314	Field Duplicate	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	14/03/2022	0089_QC210_220314	Interlab Duplicate	872911	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD367	14/03/2022	0089_SD367_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	7/06/2022	0089_SD367_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	5/09/2022	0089_QC109_220905	Field Duplicate	EP2211342	<0.0002	<0.0002	<0.0002	<0.0002	0.0011	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD367	5/09/2022	0089_QC209_220905	Interlab Duplicate	920981	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD367	5/09/2022	0089_SD367_220905	Normal	EP2211342	<0.0002	<0.0002	<0.0002	<0.0002	0.0011	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD368	17/04/2018	0089_SD368_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD368	8/01/2020	0089_SD368_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	1/04/2020	0089_SD368_0.30-0.40_200401	Normal	EP2003415	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	20/07/2020	0089_SD368_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	22/09/2020	0089_SD368_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	15/12/2020	0089_SD368_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	15/03/2021	0089_QC101_210315	Field Duplicate	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	15/03/2021	0089_QC201_210315	Interlab Duplicate	781350	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD368	15/03/2021	0089_SD368_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	10/06/2021	0089_SD368_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	1/09/2021	0089_SD368_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	11/01/2022	0089_SD368_220111	Normal	EP2200242	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	18/03/2022	0089_SD368_220318	Normal	EP2203196	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	8/06/2022	0089_SD368_220608	Normal	EP2206972	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD368	5/09/2022	0089_SD368_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD369	17/04/2018	0089_SD369_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD369	9/01/2020	0089_SD369_0.40-0.50_200109	Normal	EP2000249	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	31/03/2020	0089_SD369_0.40-0.50_200331	Normal	EP2003371	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	15/07/2020	0089_SD369_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	24/09/2020	0089_SD369_200924	Normal	EP2010272	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	15/12/2020	0089_SD369_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	16/03/2021	0089_SD369_210316	Normal	EP2102835	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	9/06/2021	0089_SD369_210609	Normal	EP2106518	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	1/09/2021	0089_SD369_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	10/01/2022	0089_SD369_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	14/03/2022	0089_QC109_220314	Field Duplicate	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	14/03/2022	0089_QC209_220314	Interlab Duplicate	872911	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD369	14/03/2022	0089_SD369_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	7/06/2022	0089_QC106_220607	Field Duplicate	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	0.0019	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	7/06/2022	0089_QC206_220607	Interlab Duplicate	896805	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002
	SD369	7/06/2022	0089_SD369_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	0.0021	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD369	5/09/2022	0089_SD369_220905	Normal	EP2211342	<0.0002	<0.0002	<0.0002	<0.0002	0.0020	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dredge Spoil and Careening Bay	SD374	18/04/2018	0089_SD374_180418	Normal	209573	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD374	8/01/2020	0089_QC107_200109	Field Duplicate	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	8/01/2020	0089_QC207_200108	Interlab Duplicate	696100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD374	8/01/2020	0089_SD374_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	30/03/2020	0089_SD374_0.40-0.50_200330	Normal	EP2003314	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	21/07/2020	0089_SD374_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	21/09/2020	0089_QC102_200921	Field Duplicate	EP2010075	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	21/09/2020	0089_QC202_200921	Interlab Duplicate	746269	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD374	21/09/2020	0089_SD374_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	14/12/2020	0089_SD374_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	15/03/2021	0089_QC105_210315	Field Duplicate	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	15/03/2021	0089_QC205_210315	Interlab Duplicate	781350	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD374	15/03/2021	0089_SD374_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	10/06/2021	0089_SD374_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	1/09/2021	0089_SD374_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	13/01/2022	0089_SD374_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	16/03/2022	0089_SD374_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	9/06/2022	0089_SD374_220609	Normal	EP2207027	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD374	6/09/2022	0089_SD374_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dredge Spoil and Careening Bay	SD375	18/04/2018	0089_SD375_180418	Normal	209573	<0.0001	<0.0001	<0.0001	<0.0001	0.0012	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD375	8/01/2020	0089_SD375_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	30/03/2020	0089_SD375_0.30-0.40_200330	Normal	EP2003314	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	21/07/2020	0089_SD375_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	21/09/2020	0089_SD375_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	14/12/2020	0089_SD375_0.30_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	15/03/2021	0089_SD375_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	10/06/2021	0089_SD375_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	1/09/2021	0089_SD375_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	13/01/2022	0089_SD375_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids						
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Dredge Spoil and Careening Bay	SD375	16/03/2022	0089_SD375_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	9/06/2022	0089_SD375_220609	Normal	EP2207027	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD375	6/09/2022	0089_SD375_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	17/04/2018	0089_SD378_180417	Normal	209522	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD378	8/01/2020	0089_SD378_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	30/03/2020	0089_SD378_0.30-0.40_200330	Normal	EP2003314	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	21/07/2020	0089_SD378_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	21/09/2020	0089_QC105_200921	Field Duplicate	EP2010075	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	21/09/2020	0089_QC205_200921	Interlab Duplicate	746269	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD378	21/09/2020	0089_SD378_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	14/12/2020	0089_SD378_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	15/03/2021	0089_SD378_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	10/06/2021	0089_QC117_210610	Field Duplicate	EP2106581	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	10/06/2021	0089_QC217_210610	Interlab Duplicate	802734	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD378	10/06/2021	0089_SD378_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	1/09/2021	0089_SD378_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	13/01/2022	0089_SD378_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	16/03/2022	0089_SD378_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	9/06/2022	0089_SD378_220609	Normal	EP2207027	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD378	6/09/2022	0089_SD378_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD380	19/04/2018	0089_SD380_180419	Normal	209623	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD380	30/01/2020	0089_SD380_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	2/04/2020	0089_-SD380_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	21/07/2020	0089_SD380_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	23/09/2020	0089_SD380_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	16/12/2020	0089_SD380_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	17/03/2021	0089_SD380_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	8/06/2021	0089_SD380_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	30/08/2021	0089_SD380_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	11/01/2022	0089_SD380_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	14/03/2022	0089_SD380_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	7/06/2022	0089_SD380_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD380	7/09/2022	0089_SD380_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD381	19/04/2018	0089_SD381_180419	Normal	209623	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD381	30/01/2020	0089_SD381_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	2/04/2020	0089_SD381_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	21/07/2020	0089_SD381_200721	Normal	EP2007596	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	23/09/2020	0089_SD381_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	16/12/2020	0089_SD381_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	17/03/2021	0089_SD381_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	8/06/2021	0089_SD381_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	30/08/2021	0089_SD381_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	11/01/2022	0089_SD381_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	14/03/2022	0089_SD381_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	7/06/2022	0089_SD381_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD381	7/09/2022	0089_SD381_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD401	19/04/2018	0089_SD379_180419	Normal	209623	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005
	SD401	30/01/2020	0089_SD401_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	2/04/2020	0089_SD401_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	21/07/2020	0089_SD401_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	23/09/2020	0089_SD401_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	16/12/2020	0089_SD401_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	17/03/2021	0089_SD401_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	8/06/2021	0089_SD401_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	30/08/2021	0089_SD401_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	11/01/2022	0089_SD401_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	14/03/2022	0089_SD401_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	7/06/2022	0089_SD401_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD401	7/09/2022	0089_SD401_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD405	14/01/2020	0089_SD405_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	1/04/2020	0089_SD405_200401	Normal	EP2003419	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	22/07/2020	0089_SD405_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	21/09/2020	0089_SD405_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	15/12/2020	0089_SD405_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	15/03/2021	0089_SD405_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	10/06/2021	0089_QC116_210610	Field Duplicate	EP2106589	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	10/06/2021	0089_QC216_210610	Interlab Duplicate	802734	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	SD405	10/06/2021	0089_SD405_210610	Normal	EP2106589	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	31/08/2021	0089_SD405_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	14/01/2022	0089_SD405_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	16/03/2022	0089_SD405_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	7/06/2022	0089_SD405_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD405	7/09/2022	0089_SD405_220907	Normal	EP2211497	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	14/01/2020	0089_SD407_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Table 4 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids						
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**													
Helicopter Support Facility	SD407	1/04/2020	0089_SD407_200401	Normal	EP2003419	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	2/04/2020	0089_SD407_200402	Normal	EP2003477	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	22/07/2020	0089_SD407_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	21/09/2020	0089_SD407_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	15/12/2020	0089_SD407_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	15/03/2021	0089_SD407_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	10/06/2021	0089_SD407_210610	Normal	EP2106589	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	31/08/2021	0089_SD407_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	14/01/2022	0089_SD407_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	16/03/2022	0089_SD407_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	7/06/2022	0089_QC114_220607	Field Duplicate	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	7/06/2022	0089_QC214_220607	Interlab Duplicate	896805	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002
	SD407	7/06/2022	0089_SD407_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD407	7/09/2022	0089_SD407_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD409	14/01/2020	0089_SD409_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	1/04/2020	0089_SD409_200401	Normal	EP2003419	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	21/07/2020	0089_SD409_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	22/09/2020	0089_SD409_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	15/12/2020	0089_SD409_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	17/03/2021	0089_SD409_210317	Normal	EP2102902	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	10/06/2021	0089_SD409_210610	Normal	EP2106589	<0.0002	<0.0002	<0.0002	<0.0002	0.0011	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	31/08/2021	0089_SD409_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	14/01/2022	0089_SD409_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	16/03/2022	0089_SD409_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	7/06/2022	0089_SD409_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD409	6/09/2022	0089_SD409_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD411	14/01/2020	0089_SD411_200114	Normal	EP2000423	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	1/04/2020	0089_SD411_1.00-1.10_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	21/07/2020	0089_SD411_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	22/09/2020	0089_SD411_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	15/12/2020	0089_SD411_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	18/03/2021	0089_SD411_210318	Normal	EP2102942	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	9/06/2021	0089_SD411_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	1/09/2021	0089_SD411_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	14/01/2022	0089_SD411_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	16/03/2022	0089_SD411_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	7/06/2022	0089_SD411_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD411	6/09/2022	0089_SD411_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD413	14/01/2020	0089_SD413_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	1/04/2020	0089_SD413_0.60-0.70_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	21/07/2020	0089_SD413_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	22/09/2020	0089_SD413_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	15/12/2020	0089_SD413_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	18/03/2021	0089_SD413_210318	Normal	EP2102942	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	9/06/2021	0089_SD413_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	1/09/2021	0089_SD413_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	14/01/2022	0089_SD413_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	16/03/2022	0089_SD413_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	7/06/2022	0089_SD413_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD413	6/09/2022	0089_SD413_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD415	14/01/2020	0089_SD415_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	1/04/2020	0089_SD415_0.50-0.60_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	21/07/2020	0089_SD415_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	22/09/2020	0089_SD415_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	15/12/2020	0089_SD415_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	18/03/2021	0089_SD415_210318	Normal	EP2102942	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	9/06/2021	0089_SD415_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	1/09/2021	0089_SD415_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	14/01/2022	0089_SD415_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	16/03/2022	0089_SD415_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	7/06/2022	0089_SD415_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	SD415	6/09/2022	0089_SD415_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:

First Time detection of PFOA or PFHxS+PFOS

Cardno now Stantec

Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																		
Waste Water Treatment Plant	SD304	17/04/2018	0089_SD304_180417	Normal	209522	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD304	8/01/2020	0089_SD304_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD304	1/04/2020	0089_SD304_0.40-0.50_200401	Normal	EP2003415	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD304	20/07/2020	0089_SD304_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD304	22/09/2020	0089_SD304_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD304	15/12/2020	0089_SD304_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD304	15/03/2021	0089_SD304_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD304	10/06/2021	0089_SD304_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD304	1/09/2021	0089_SD304_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD304	11/01/2022	0089_SD304_220111	Normal	EP2200242	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD304	18/03/2022	0089_SD304_220318	Normal	EP2203196	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD304	8/06/2022	0089_SD304_220608	Normal	EP2206972	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD304	5/09/2022	0089_SD304_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD306	18/04/2018	0089_SD306_180418	Normal	209573	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD306	10/01/2020	0089_SD306_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	31/03/2020	0089_SD306_200331_1.00-1.20_200331	Normal	EP2003368	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	22/07/2020	0089_SD306_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	23/09/2020	0089_SD306_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	15/12/2020	0089_SD306_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	17/03/2021	0089_SD306_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	9/06/2021	0089_SD306_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	31/08/2021	0089_QC115_210831	Field Duplicate	EP2110074	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	31/08/2021	0089_QC215_210831	Interlab Duplicate	821197	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD306	31/08/2021	0089_SD306_210831	Normal	EP2110074	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	13/01/2022	0089_SD306_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	16/03/2022	0089_SD306_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	7/06/2022	0089_SD306_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD306	6/09/2022	0089_SD306_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD307	30/04/2018	0089_SD307_180430	Normal	209959	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD307	10/01/2020	0089_SD307_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	31/03/2020	0089_SD307_200331_1.00-1.20_200331	Normal	EP2003368	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	22/07/2020	0089_SD307_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	23/09/2020	0089_SD307_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	15/12/2020	0089_SD307_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	17/03/2021	0089_SD307_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	9/06/2021	0089_SD307_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	31/08/2021	0089_SD307_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	13/01/2022	0089_SD307_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	16/03/2022	0089_SD307_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	7/06/2022	0089_SD307_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD307	6/09/2022	0089_SD307_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD308	30/04/2018	0089_SD308_180430	Normal	209959	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD308	10/01/2020	0089_SD308_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	1/04/2020	0089_SD308_1.00-1.20_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	22/07/2020	0089_SD308_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	23/09/2020	0089_SD308_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	15/12/2020	0089_SD308_0.50_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	17/03/2021	0089_QC117_210317	Field Duplicate	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	17/03/2021	0089_QC217_210317	Interlab Duplicate	782088	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD308	17/03/2021	0089_SD308_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	9/06/2021	0089_SD308_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	31/08/2021	0089_SD308_210831	Normal	EP2110074	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	13/01/2022	0089_SD308_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	16/03/2022	0089_SD308_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	7/06/2022	0089_SD308_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD308	6/09/2022	0089_SD308_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD314	18/04/2018	0089_SD314_180418	Normal	209573	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD314	10/01/2020	0089_SD314_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	31/03/2020	0089_SD314_200331_0.60-0.80_200331	Normal	EP2003368	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	22/07/2020	0089_SD314_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	23/09/2020	0089_SD314_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	15/12/2020	0089_SD314_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	17/03/2021	0089_SD314_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	9/06/2021	0089_SD314_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	31/08/2021	0089_SD314_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	13/01/2022	0089_SD314_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	16/03/2022	0089_SD314_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	7/06/2022	0089_QC102_220607	Field Duplicate	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	7/06/2022	0089_QC202_220607	Interlab Duplicate	896805	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
	SD314	7/06/2022	0089_SD314_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD314	6/09/2022	0089_SD314_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	30/04/2018	0089_SD315_180430	Normal	209959	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			

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Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Helicopter Support Facility	SD315	10/01/2020	0089_SD315_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	1/04/2020	0089_SD315_1.00-1.20_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	22/07/2020	0089_SD315_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	23/09/2020	0089_SD315_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	15/12/2020	0089_SD315_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	17/03/2021	0089_SD315_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	9/06/2021	0089_SD315_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	31/08/2021	0089_SD315_210831	Normal	EP2110074	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	13/01/2022	0089_SD315_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	16/03/2022	0089_SD315_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	7/06/2022	0089_SD315_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD315	6/09/2022	0089_SD315_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD316	30/04/2018	0089_SD316_180430	Normal	209959	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD316	10/01/2020	0089_SD316_200110	Normal	EP2000288	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	1/04/2020	0089_SD316_1.20-1.40_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	22/07/2020	0089_SD316_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	23/09/2020	0089_SD316_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	15/12/2020	0089_SD316_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	17/03/2021	0089_SD316_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	9/06/2021	0089_SD316_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	31/08/2021	0089_SD316_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	13/01/2022	0089_SD316_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	16/03/2022	0089_SD316_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	7/06/2022	0089_SD316_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD316	6/09/2022	0089_SD316_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Ground	SD329	12/04/2018	0089_SD329_180412	Normal	209345	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD329	10/01/2020	0089_SD329_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	30/03/2020	0089_SD329_200330_0.50-0.60_200330	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	20/07/2020	0089_SD329_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	23/09/2020	0089_SD329_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	14/12/2020	0089_QC101_201214	Field Duplicate	EP2013974	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	14/12/2020	0089_QC201_201114	Interlab Duplicate	765054	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD329	14/12/2020	0089_SD329_201214	Normal	EP2013974	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	16/03/2021	0089_SD329_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	8/06/2021	0089_QC104_210608	Field Duplicate	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	8/06/2021	0089_QC204_210608	Interlab Duplicate	802464	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD329	8/06/2021	0089_SD329_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	30/08/2021	0089_SD329_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	10/01/2022	0089_QC109_220110	Field Duplicate	EP2200219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	10/01/2022	0089_QC209_220110	Interlab Duplicate	854607	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD329	10/01/2022	0089_SD329_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	15/03/2022	0089_QC115_220315	Field Duplicate	EP2203020	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	15/03/2022	0089_QC215_220315	Interlab Duplicate	872903	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD329	15/03/2022	0089_SD329_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	8/06/2022	0089_SD329_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD329	5/09/2022	0089_SD329_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Ground	SD330	12/04/2018	0089_SD330_180412	Normal	209345	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD330	10/01/2020	0089_SD330_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	30/03/2020	0089_SD330_200330_0.50-0.60_200330	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	20/07/2020	0089_SD330_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	22/09/2020	0089_SD330_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	14/12/2020	0089_SD330_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	16/03/2021	0089_SD330_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	8/06/2021	0089_SD330_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	30/08/2021	0089_SD330_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	10/01/2022	0089_SD330_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	15/03/2022	0089_SD330_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	8/06/2022	0089_SD330_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD330	5/09/2022	0089_SD330_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Ground	SD331	12/04/2018	0089_SD331_180412	Normal	209345	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD331	10/01/2020	0089_SD331_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	30/03/2020	0089_SD331_200330_0.30-0.50_200330	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	20/07/2020	0089_SD331_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	23/09/2020	0089_SD331_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	14/12/2020	0089_QC103_201214	Field Duplicate	EP2013974	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	14/12/2020	0089_QC203_201114	Interlab Duplicate	765054	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD331	14/12/2020	0089_SD331_201214	Normal	EP2013974	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	16/03/2021	0089_SD331_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	8/06/2021	0089_SD331_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	30/08/2021	0089_SD331_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	10/01/2022	0089_SD331_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	15/03/2022	0089_SD331_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	8/06/2022	0089_SD331_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD331	5/09/2022	0089_SD331_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

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Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																		
Fire Training Area	SD335	13/04/2018	0089_QC1SD_180413	Field Duplicate	209417	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD335	13/04/2018	0089_QC2SD_180413	Interlab Duplicate	594110	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05
	SD335	13/04/2018	0089_SD335_180413	Normal	209417	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD335	9/01/2020	0089_SD335_0.40-0.50_200109	Normal	EP2000250	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	30/03/2020	0089_SD335_0.50_200330	Normal	EP2003315	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	15/07/2020	0089_QC101_200715	Field Duplicate	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	15/07/2020	0089_QC201_200215	Interlab Duplicate	732844	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD335	15/07/2020	0089_SD335_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	22/09/2020	0089_SD335_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	14/12/2020	0089_SD335_201214	Normal	EP2013986	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	15/03/2021	0089_SD335_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
	SD335	8/06/2021	0089_SD335_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	30/08/2021	0089_SD335_210830	Normal	EP2110022	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	10/01/2022	0089_QC103_220110	Field Duplicate	EP2200217	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	10/01/2022	0089_QC203_220110	Interlab Duplicate	854607	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD335	10/01/2022	0089_SD335_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	14/03/2022	0089_SD335_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD335	7/06/2022	0089_QC113_220607	Field Duplicate	EP2206882	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD335	7/06/2022	0089_QC213_220607	Interlab Duplicate	896805	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
	SD335	7/06/2022	0089_SD335_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD335	5/09/2022	0089_SD335_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Fire Training Area	SD340	13/04/2018	0089_SD340_180413	Normal	209417	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD340	9/01/2020	0089_SD340_0.40-0.50_200109	Normal	EP2000250	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	30/03/2020	0089_QC108_200330	Field Duplicate	EP2003315	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	30/03/2020	0089_QC208_200330	Interlab Duplicate	711144	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD340	30/03/2020	0089_SD340_200330	Normal	EP2003315	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	15/07/2020	0089_SD340_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	22/09/2020	0089_SD340_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	14/12/2020	0089_SD340_201214	Normal	EP2013987	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	15/03/2021	0089_SD340_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	8/06/2021	0089_SD340_210608	Normal	EP2106449	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	30/08/2021	0089_QC107_210830	Field Duplicate	EP2110023	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	30/08/2021	0089_QC207_210830	Interlab Duplicate	820919	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD340	30/08/2021	0089_SD340_210830	Normal	EP2110023	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	10/01/2022	0089_SD340_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	14/03/2022	0089_SD340_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	7/06/2022	0089_SD340_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD340	5/09/2022	0089_QC105_220905	Field Duplicate	EP2211346	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD340	5/09/2022	0089_QC205_220905	Interlab Duplicate	920981	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD340	5/09/2022	0089_SD340_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	SD341	13/04/2018	0089_SD341_180413	Normal	209417	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD341	8/01/2020	0089_QC105_200108	Field Duplicate	EP2000181	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	8/01/2020	0089_QC205_200108	Interlab Duplicate	696100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD341	8/01/2020	0089_SD341_200108	Normal	EP2000181	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	31/03/2020	0089_SD341_200331	Normal	EP2003365	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	15/07/2020	0089_SD341_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	22/09/2020	0089_SD341_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	14/12/2020	0089_SD341_201214	Normal	EP2013987	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	15/03/2021	0089_SD341_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	8/06/2021	0089_SD341_210608	Normal	EP2106449	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	30/08/2021	0089_SD341_210830	Normal	EP2110022	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	10/01/2022	0089_SD341_220110	Normal	EP2200213	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	14/03/2022	0089_SD341_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	7/06/2022	0089_SD341_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD341	5/09/2022	0089_SD341_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
Waste Water Treatment Plant	SD345	13/04/2018	0089_SD345_180413	Normal	209417	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD345	9/01/2020	0089_SD345_0.30-0.40_200109	Normal	EP2000250	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD345	31/03/2020	0089_SD345_0.40-0.50_200331	Normal	EP2003371	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD345	24/09/2020	0089_SD345_200924	Normal	EP2010272	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD345	15/12/2020	0089_SD345_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD345	16/03/2021	0089_SD345_210316	Normal	EP2102835	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0017	0.0017	0.0017
	SD345	9/06/2021	0089_SD345_210609	Normal	EP2106518	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD345	1/09/2021	0089_SD345_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD345	10/01/2022	0089_SD345_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD345	14/03/2022	0089_SD345_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD345	7/06/2022	0089_SD345_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0007	0.0007	0.0007
	SD345	5/09/2022	0089_SD345_220905	Normal	EP2211342	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0016	0.0016	0.0016
	SD346	17/04/2018	0089_SD346_180417	Normal	209522	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD346	8/01/2020	0089_SD346_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD346	1/04/2020	0089_SD346_0.30-0.40_200401	Normal	EP2003415	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0009
	SD346	15/07/2020	0089_SD346_200715	Normal	EP2007387	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0012	0.0012	0.0012
	SD346	22/09/2020	0089_SD346_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0116	0.0116	0.0116
	SD346	15/12/2020	0089_SD346_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0096	0.0096	0.0096
	SD346	17/03/2021	0089_SD346_210317	Normal	EP2102902	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0008	0.0008	0.0008

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Table 4 - Sediment Analytical Results

							PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																		
Accommodation Area	SD346	10/06/2021	0089_SD346_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0028	0.0028	0.0028
	SD346	30/08/2021	0089_QC105_210830	Field Duplicate	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0022	0.0022	0.0022
	SD346	30/08/2021	0089_QC205_210830	Interlab Duplicate	820919	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD346	30/08/2021	0089_SD346_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0024	0.0024	0.0024
	SD346	12/01/2022	0089_QC117_220112	Field Duplicate	EP2200290	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0070	0.0070	0.0070
	SD346	12/01/2022	0089_QC217_220112	Interlab Duplicate	855202	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD346	12/01/2022	0089_SD346_220112	Normal	EP2200290	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0032	0.0032	0.0032
	SD346	18/03/2022	0089_SD346_220318	Normal	EP2203196	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0177	0.0179	0.0179
	SD346	8/06/2022	0089_SD346_220608	Normal	EP2206972	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0019	0.0019	0.0019
	SD346	6/09/2022	0089_SD346_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0025	0.0025	0.0025
Waste Water Treatment Plant	SD350	19/04/2018	0089_SD350_180419	Normal	209623	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD350	30/01/2020	0089_SD350_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD350	2/04/2020	0089_SD350_200402	Normal	EP2003477	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD350	21/07/2020	0089_SD350_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD350	23/09/2020	0089_SD350_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD350	16/12/2020	0089_SD350_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD350	17/03/2021	0089_SD350_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
	SD350	8/06/2021	0089_SD350_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD350	30/08/2021	0089_SD350_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD350	11/01/2022	0089_SD350_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD350	14/03/2022	0089_SD350_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD350	7/06/2022	0089_SD350_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD350	7/09/2022	0089_SD350_220907	Normal	EP2211497	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD351	19/04/2018	0089_SD351_180419	Normal	209623	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD351	30/01/2020	0089_SD351_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	2/04/2020	0089_SD351_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	21/07/2020	0089_SD351_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	23/09/2020	0089_SD351_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	16/12/2020	0089_SD351_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	17/03/2021	0089_SD351_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	8/06/2021	0089_SD351_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD351	30/08/2021	0089_SD351_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	11/01/2022	0089_SD351_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	14/03/2022	0089_SD351_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	7/06/2022	0089_SD351_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD351	7/09/2022	0089_SD351_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD352	19/04/2018	0089_SD352_180419	Normal	209623	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD352	30/01/2020	0089_SD352_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	21/07/2020	0089_SD352_200721	Normal	EP2007596	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	23/09/2020	0089_SD352_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	16/12/2020	0089_SD352_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	17/03/2021	0089_SD352_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	8/06/2021	0089_SD352_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	30/08/2021	0089_SD352_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	11/01/2022	0089_SD352_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	14/03/2022	0089_SD352_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	7/06/2022	0089_SD352_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD352	7/09/2022	0089_SD352_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Ground	SD356	12/04/2018	0089_QC1SD_180412	Field Duplicate	209345	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD356	12/04/2018	0089_QC2SD_180412	Interlab Duplicate	594110	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05
	SD356	12/04/2018	0089_SD356_180412	Normal	209345	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD356	10/01/2020	0089_SD356_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	30/03/2020	0089_SD356_200330_0.50-0.60_200330	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	20/07/2020	0089_SD356_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	23/09/2020	0089_SD356_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	14/12/2020	0089_SD356_201214	Normal	EP2013974	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	16/03/2021	0089_SD356_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	8/06/2021	0089_SD356_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	30/08/2021	0089_QC109_210830	Field Duplicate	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	30/08/2021	0089_QC209_210830	Interlab Duplicate	820919	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD356	30/08/2021	0089_SD356_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	10/01/2022	0089_SD356_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	15/03/2022	0089_QC112_220315	Field Duplicate	EP2203020	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	15/03/2022	0089_QC212_220315	Interlab Duplicate	872903	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD356	15/03/2022	0089_SD356_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	8/06/2022	0089_SD356_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD356	5/09/2022	0089_SD356_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	12/04/2018	0089_SD357_180412	Normal	209345	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD357	10/01/2020	0089_SD357_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	30/03/2020	0089_SD357_200330_0.40-0.60_200330	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	20/07/2020	0089_SD357_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	23/09/2020	0089_SD357_200923	Normal	EP2010221	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	14/12/2020	0089_SD357_201214	Normal	EP2013974	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	16/03/2021	0089_SD357_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

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Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Demolition Ground	SD357	8/06/2021	0089_SD357_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	30/08/2021	0089_SD357_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	10/01/2022	0089_SD357_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	15/03/2022	0089_SD357_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	8/06/2022	0089_SD357_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	5/09/2022	0089_QC107_220905	Field Duplicate	EP2211348	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD357	5/09/2022	0089_QC207_220905	Interlab Duplicate	920981	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD357	5/09/2022	0089_SD357_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition Ground	SD358	12/04/2018	0089_SD358_180412	Normal	209345	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD358	10/01/2020	0089_SD358_200110	Normal	EP2000253	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	30/03/2020	0089_SD358_200330_0.50-0.60_200330	Normal	EP2003310	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	20/07/2020	0089_SD358_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	23/09/2020	0089_SD358_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	14/12/2020	0089_SD358_0.30_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	16/03/2021	0089_SD358_210316	Normal	EP2102838	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	8/06/2021	0089_QC108_210608	Field Duplicate	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	8/06/2021	0089_QC208_210608	Interlab Duplicate	802464	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD358	8/06/2021	0089_SD358_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	30/08/2021	0089_SD358_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	10/01/2022	0089_SD358_220110	Normal	EP2200219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	15/03/2022	0089_SD358_220315	Normal	EP2203020	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	8/06/2022	0089_SD358_220608	Normal	EP2206968	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD358	5/09/2022	0089_SD358_220905	Normal	EP2211348	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	SD362	13/04/2018	0089_SD362_180413	Normal	209417	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD362	8/01/2020	0089_SD362_200108	Normal	EP2000181	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	31/03/2020	0089_SD362_200331	Normal	EP2003365	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	15/07/2020	0089_QC102_200715	Field Duplicate	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	15/07/2020	0089_QC202_200215	Interlab Duplicate	732844	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD362	15/07/2020	0089_SD362_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	22/09/2020	0089_SD362_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	14/12/2020	0089_SD362_201214	Normal	EP2013987	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	15/03/2021	0089_SD362_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD362	8/06/2021	0089_SD362_210608	Normal	EP2106449	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	30/08/2021	0089_SD362_210830	Normal	EP2110023	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	10/01/2022	0089_SD362_220110	Normal	EP2200213	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	14/03/2022	0089_SD362_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	7/06/2022	0089_SD362_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD362	5/09/2022	0089_SD362_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Fire Training Area	SD363	13/04/2018	0089_SD363_180413	Normal	209417	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD363	8/01/2020	0089_SD363_200108	Normal	EP2000181	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	31/03/2020	0089_SD363_200331	Normal	EP2003365	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	15/07/2020	0089_SD363_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	22/09/2020	0089_SD363_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	14/12/2020	0089_SD363_201214	Normal	EP2013987	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	15/03/2021	0089_SD363_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	8/06/2021	0089_SD363_210608	Normal	EP2106449	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	30/08/2021	0089_SD363_210830	Normal	EP2110023	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	10/01/2022	0089_SD363_220110	Normal	EP2200213	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	14/03/2022	0089_SD363_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	7/06/2022	0089_SD363_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD363	5/09/2022	0089_QC112_220905	Field Duplicate	EP2211342	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD363	5/09/2022	0089_QC212_220905	Interlab Duplicate	920981	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD363	5/09/2022	0089_SD363_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
Fire Training Area	SD364	13/04/2018	0089_SD364_180413	Normal	209417	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD364	9/01/2020	0089_SD364_0.40-0.50_200109	Normal	EP2000250	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	30/03/2020	0089_QC106_200330	Field Duplicate	EP2003315	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	30/03/2020	0089_QC206_200330	Interlab Duplicate	711144	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD364	30/03/2020	0089_SD364_200330	Normal	EP2003315	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	15/07/2020	0089_SD364_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	22/09/2020	0089_SD364_200922	Normal	EP2010152	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	14/12/2020	0089_SD364_201214	Normal	EP2013986	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	15/03/2021	0089_SD364_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	8/06/2021	0089_SD364_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	30/08/2021	0089_SD364_210830	Normal	EP2110022	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	10/01/2022	0089_SD364_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	14/03/2022	0089_SD364_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	7/06/2022	0089_SD364_220607	Normal	EP2206882	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD364	5/09/2022	0089_SD364_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD367	17/04/2018	0089_SD367_180417	Normal	209522	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD367	8/01/2020	0089_SD367_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD367	31/03/2020	0089_SD367_0.40-0.50_200331	Normal	EP2003371	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD367	15/07/2020	0089_SD367_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD367	22/09/2020	0089_SD367_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD367	15/12/2020	0089_SD367_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0007	0.0007	0.0007

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Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Waste Water Treatment Plant	SD367	15/03/2021	0089_SD367_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD367	9/06/2021	0089_SD367_210609	Normal	EP2106518	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD367	1/09/2021	0089_SD367_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD367	11/01/2022	0089_QC114_220111	Field Duplicate	EP2200242	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD367	11/01/2022	0089_QC214_220111	Interlab Duplicate	855202	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD367	11/01/2022	0089_SD367_220111	Normal	EP2200242	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD367	14/03/2022	0089_QC110_220314	Field Duplicate	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD367	14/03/2022	0089_QC210_220314	Interlab Duplicate	872911	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD367	14/03/2022	0089_SD367_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD367	7/06/2022	0089_SD367_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0008	0.0008	0.0008
	SD367	5/09/2022	0089_QC109_220905	Field Duplicate	EP2211342	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0011	0.0011	0.0011
	SD367	5/09/2022	0089_QC209_220905	Interlab Duplicate	920981	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD367	5/09/2022	0089_SD367_220905	Normal	EP2211342	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0011	0.0011	0.0011
Waste Water Treatment Plant	SD368	17/04/2018	0089_SD368_180417	Normal	209522	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD368	8/01/2020	0089_SD368_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD368	1/04/2020	0089_SD368_0.30-0.40_200401	Normal	EP2003415	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD368	20/07/2020	0089_SD368_200720	Normal	EP2007546	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD368	22/09/2020	0089_SD368_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD368	15/12/2020	0089_SD368_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD368	15/03/2021	0089_QC101_210315	Field Duplicate	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD368	15/03/2021	0089_QC201_210315	Interlab Duplicate	781350	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD368	15/03/2021	0089_SD368_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD368	10/06/2021	0089_SD368_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0010	0.0010	0.0010
	SD368	1/09/2021	0089_SD368_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD368	11/01/2022	0089_SD368_220111	Normal	EP2200242	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD368	18/03/2022	0089_SD368_220318	Normal	EP2203196	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD368	8/06/2022	0089_SD368_220608	Normal	EP2206972	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
	SD368	5/09/2022	0089_SD368_220905	Normal	EP2211346	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD369	17/04/2018	0089_SD369_180417	Normal	209522	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD369	9/01/2020	0089_SD369_0.40-0.50_200109	Normal	EP2000249	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD369	31/03/2020	0089_SD369_0.40-0.50_200331	Normal	EP2003371	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0025	0.0025
	SD369	15/07/2020	0089_SD369_200715	Normal	EP2007384	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD369	24/09/2020	0089_SD369_200924	Normal	EP2010272	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD369	15/12/2020	0089_SD369_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD369	16/03/2021	0089_SD369_210316	Normal	EP2102835	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD369	9/06/2021	0089_SD369_210609	Normal	EP2106518	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD369	1/09/2021	0089_SD369_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD369	10/01/2022	0089_SD369_220110	Normal	EP2200217	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD369	14/03/2022	0089_QC109_220314	Field Duplicate	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD369	14/03/2022	0089_QC209_220314	Interlab Duplicate	872911	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD369	14/03/2022	0089_SD369_220314	Normal	EP2202978	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
	SD369	7/06/2022	0089_QC106_220607	Field Duplicate	EP2206885	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0019	0.0019	0.0019
	SD369	7/06/2022	0089_QC206_220607	Interlab Duplicate	896805	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
	SD369	7/06/2022	0089_SD369_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0021	0.0021	0.0021
	SD369	5/09/2022	0089_SD369_220905	Normal	EP2211342	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0020	0.0020	0.0020
Dredge Spoil and Careening Bay	SD374	18/04/2018	0089_SD374_180418	Normal	209573	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD374	8/01/2020	0089_QC107_200109	Field Duplicate	EP2000187	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	8/01/2020	0089_QC207_200108	Interlab Duplicate	696100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD374	8/01/2020	0089_SD374_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	30/03/2020	0089_SD374_0.40-0.50_200330	Normal	EP2003314	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD374	21/07/2020	0089_SD374_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	21/09/2020	0089_QC102_200921	Field Duplicate	EP2010075	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD374	21/09/2020	0089_QC202_200921	Interlab Duplicate	746269	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD374	21/09/2020	0089_SD374_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD374	14/12/2020	0089_SD374_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	15/03/2021	0089_QC105_210315	Field Duplicate	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	15/03/2021	0089_QC205_210315	Interlab Duplicate	781350	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD374	15/03/2021	0089_SD374_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	10/06/2021	0089_SD374_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD374	1/09/2021	0089_SD374_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	13/01/2022	0089_SD374_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	16/03/2022	0089_SD374_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD374	9/06/2022	0089_SD374_220609	Normal	EP2207027	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD374	6/09/2022	0089_SD374_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
Dredge Spoil and Careening Bay	SD375	18/04/2018	0089_SD375_180418	Normal	209573	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD375	8/01/2020	0089_SD375_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD375	30/03/2020	0089_SD375_0.30-0.40_200330	Normal	EP2003314	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD375	21/07/2020	0089_SD375_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD375	21/09/2020	0089_SD375_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD375	14/12/2020	0089_SD375_0.30_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD375	15/03/2021	0089_SD375_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD375	10/06/2021	0089_SD375_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD375	1/09/2021	0089_SD375_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD375	13/01/2022	0089_SD375_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002

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Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																	
Dredge Spoil and Careening Bay	SD375	16/03/2022	0089_SD375_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD375	9/06/2022	0089_SD375_220609	Normal	EP2207027	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD375	6/09/2022	0089_SD375_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD378	17/04/2018	0089_SD378_180417	Normal	209522	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD378	8/01/2020	0089_SD378_200109	Normal	EP2000187	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD378	30/03/2020	0089_SD378_0.30-0.40_200330	Normal	EP2003314	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD378	21/07/2020	0089_SD378_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD378	21/09/2020	0089_QC105_200921	Field Duplicate	EP2010075	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD378	21/09/2020	0089_QC205_200921	Interlab Duplicate	746269	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD378	21/09/2020	0089_SD378_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD378	14/12/2020	0089_SD378_201214	Normal	EP2013990	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD378	15/03/2021	0089_SD378_210315	Normal	EP2102757	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD378	10/06/2021	0089_QC117_210610	Field Duplicate	EP2106581	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD378	10/06/2021	0089_QC217_210610	Interlab Duplicate	802734	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD378	10/06/2021	0089_SD378_210610	Normal	EP2106581	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD378	1/09/2021	0089_SD378_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
	SD378	13/01/2022	0089_SD378_220113	Normal	EP2200341	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD378	16/03/2022	0089_SD378_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD378	9/06/2022	0089_SD378_220609	Normal	EP2207027	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD378	6/09/2022	0089_SD378_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Waste Water Treatment Plant	SD380	19/04/2018	0089_SD380_180419	Normal	209623	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD380	30/01/2020	0089_SD380_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD380	2/04/2020	0089_-SD380_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD380	21/07/2020	0089_SD380_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD380	23/09/2020	0089_SD380_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD380	16/12/2020	0089_SD380_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD380	17/03/2021	0089_SD380_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD380	8/06/2021	0089_SD380_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD380	30/08/2021	0089_SD380_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD380	11/01/2022	0089_SD380_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD380	14/03/2022	0089_SD380_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD380	7/06/2022	0089_SD380_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD380	7/09/2022	0089_SD380_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD381	19/04/2018	0089_SD381_180419	Normal	209623	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD381	30/01/2020	0089_SD381_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	2/04/2020	0089_SD381_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	21/07/2020	0089_SD381_200721	Normal	EP2007596	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	23/09/2020	0089_SD381_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	16/12/2020	0089_SD381_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	17/03/2021	0089_SD381_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	8/06/2021	0089_SD381_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	30/08/2021	0089_SD381_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	11/01/2022	0089_SD381_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	14/03/2022	0089_SD381_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	7/06/2022	0089_SD381_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD381	7/09/2022	0089_SD381_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Waste Water Treatment Plant	SD401	19/04/2018	0089_SD379_180419	Normal	209623	<0.0005	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002	<0.005			
	SD401	30/01/2020	0089_SD401_200130	Normal	EP2001005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD401	2/04/2020	0089_SD401_0.80-0.90_200402	Normal	EP2003475	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD401	21/07/2020	0089_SD401_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD401	23/09/2020	0089_SD401_200923	Normal	EP2010219	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD401	16/12/2020	0089_SD401_201216	Normal	EP2014091	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD401	17/03/2021	0089_SD401_210317	Normal	EP2102888	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
	SD401	8/06/2021	0089_SD401_210608	Normal	EP2106466	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD401	30/08/2021	0089_SD401_210830	Normal	EP2110018	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD401	11/01/2022	0089_SD401_220111	Normal	EP2200279	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
	SD401	14/03/2022	0089_SD401_220314	Normal	EP2202979	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD401	7/06/2022	0089_SD401_220607	Normal	EP2206885	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD401	7/09/2022	0089_SD401_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD405	14/01/2020	0089_SD405_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD405	1/04/2020	0089_SD405_200401	Normal	EP2003419	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD405	22/07/2020	0089_SD405_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD405	21/09/2020	0089_SD405_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD405	15/12/2020	0089_SD405_201215	Normal	EP2014049	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD405	15/03/2021	0089_SD405_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD405	10/06/2021	0089_QC116_210610	Field Duplicate	EP2106589	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
	SD405	10/06/2021	0089_QC216_210610	Interlab Duplicate	802734	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
	SD405	10/06/2021	0089_SD405_210610	Normal	EP2106589	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
	SD405	31/08/2021	0089_SD405_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD405	14/01/2022	0089_SD405_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD405	16/03/2022	0089_SD405_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD405	7/06/2022	0089_SD405_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD405	7/09/2022	0089_SD405_220907	Normal	EP2211497	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	14/01/2020	0089_SD407_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

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Table 4 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																		
Helicopter Support Facility	SD407	1/04/2020	0089_SD407_200401	Normal	EP2003419	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	2/04/2020	0089_SD407_200402	Normal	EP2003477	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	22/07/2020	0089_SD407_200722	Normal	EP2007650	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	21/09/2020	0089_SD407_200921	Normal	EP2010075	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	15/12/2020	0089_SD407_201215	Normal	EP2014052	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	15/03/2021	0089_SD407_210315	Normal	EP2102754	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	10/06/2021	0089_SD407_210610	Normal	EP2106589	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	31/08/2021	0089_SD407_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	14/01/2022	0089_SD407_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	16/03/2022	0089_SD407_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	7/06/2022	0089_QC114_220607	Field Duplicate	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	7/06/2022	0089_QC214_220607	Interlab Duplicate	896805	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
	SD407	7/06/2022	0089_SD407_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD407	7/09/2022	0089_SD407_220907	Normal	EP2211499	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD409	14/01/2020	0089_SD409_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	1/04/2020	0089_SD409_200401	Normal	EP2003419	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	21/07/2020	0089_SD409_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	22/09/2020	0089_SD409_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	15/12/2020	0089_SD409_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	17/03/2021	0089_SD409_210317	Normal	EP2102902	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	10/06/2021	0089_SD409_210610	Normal	EP2106589	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0011	0.0011	0.0011
	SD409	31/08/2021	0089_SD409_210831	Normal	EP2110067	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	14/01/2022	0089_SD409_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	16/03/2022	0089_SD409_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	7/06/2022	0089_SD409_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD409	6/09/2022	0089_SD409_220906	Normal	EP2211393	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD411	14/01/2020	0089_SD411_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	0.0004
	SD411	1/04/2020	0089_SD411_1.00-1.10_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	21/07/2020	0089_SD411_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	22/09/2020	0089_SD411_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	15/12/2020	0089_SD411_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	18/03/2021	0089_SD411_210318	Normal	EP2102942	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	9/06/2021	0089_SD411_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	1/09/2021	0089_SD411_210901	Normal	EP2110156	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	14/01/2022	0089_SD411_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	16/03/2022	0089_SD411_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	7/06/2022	0089_SD411_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD411	6/09/2022	0089_SD411_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD413	14/01/2020	0089_SD413_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	1/04/2020	0089_SD413_0.60-0.70_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	21/07/2020	0089_SD413_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	22/09/2020	0089_SD413_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	15/12/2020	0089_SD413_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	18/03/2021	0089_SD413_210318	Normal	EP2102942	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	9/06/2021	0089_SD413_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	1/09/2021	0089_SD413_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	14/01/2022	0089_SD413_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	16/03/2022	0089_SD413_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	7/06/2022	0089_SD413_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD413	6/09/2022	0089_SD413_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Helicopter Support Facility	SD415	14/01/2020	0089_SD415_200114	Normal	EP2000423	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	1/04/2020	0089_SD415_0.50-0.60_200401	Normal	EP2003416	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	21/07/2020	0089_SD415_200721	Normal	EP2007603	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	22/09/2020	0089_SD415_200922	Normal	EP2010144	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	15/12/2020	0089_SD415_201215	Normal	EP2014043	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	18/03/2021	0089_SD415_210318	Normal	EP2102942	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	9/06/2021	0089_SD415_210609	Normal	EP2106520	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	1/09/2021	0089_SD415_210901	Normal	EP2110157	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	14/01/2022	0089_SD415_220114	Normal	EP2200401	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	16/03/2022	0089_SD415_220316	Normal	EP2203059	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	7/06/2022	0089_SD415_220607	Normal	EP2206886	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
	SD415	6/09/2022	0089_SD415_220906	Normal	EP2211402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Notes:

First Time detection of PFOA or PFHxS+PFOS

Trend Report

Report Date & Time: 2023-03-02 00:48:47

Data File Name: inputPFOS2022.csv

Report Title: PFOS Trend in Groundwater

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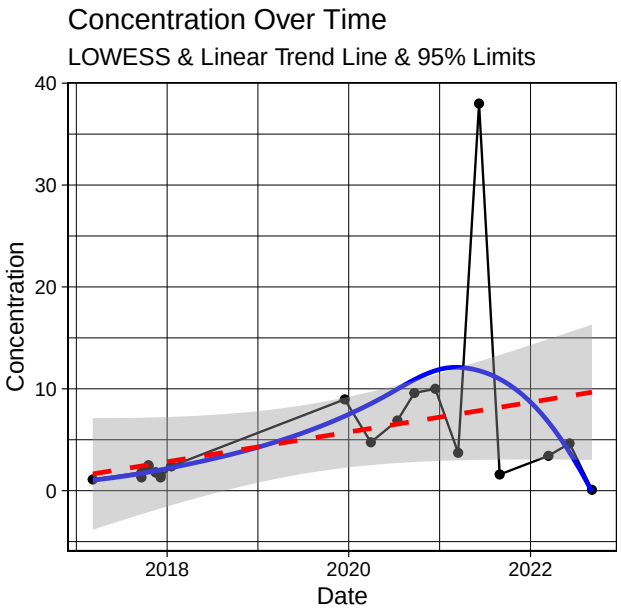
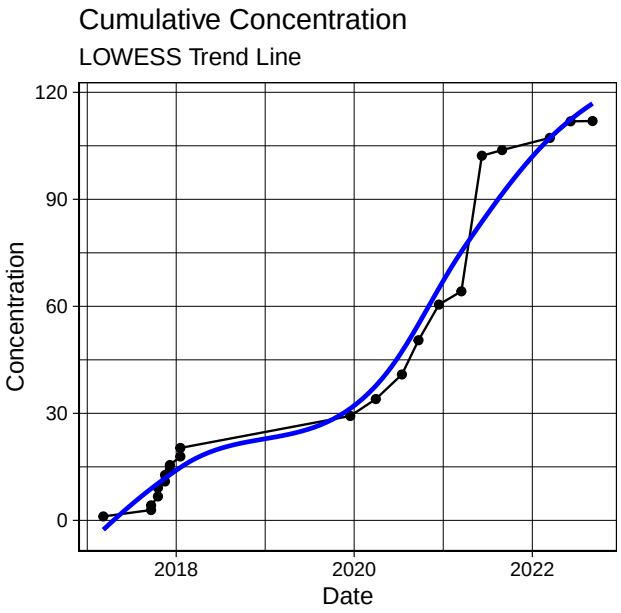
Kendall Trend Test Results Continuous	
n	22
z	2.12
p	0.03
S	76
varS	1249.33
tau	0.33
mean	5.09
sd	7.89
cov	1.55
results	INCREASING

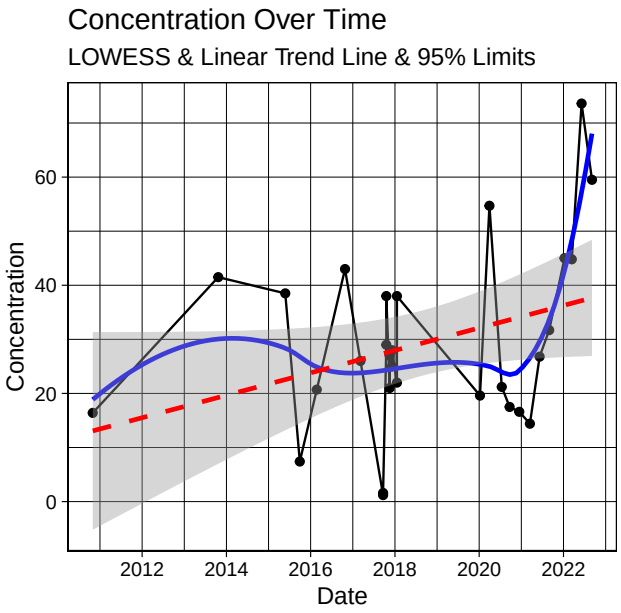
Report for ID : MW109 and Analyte : PFOS

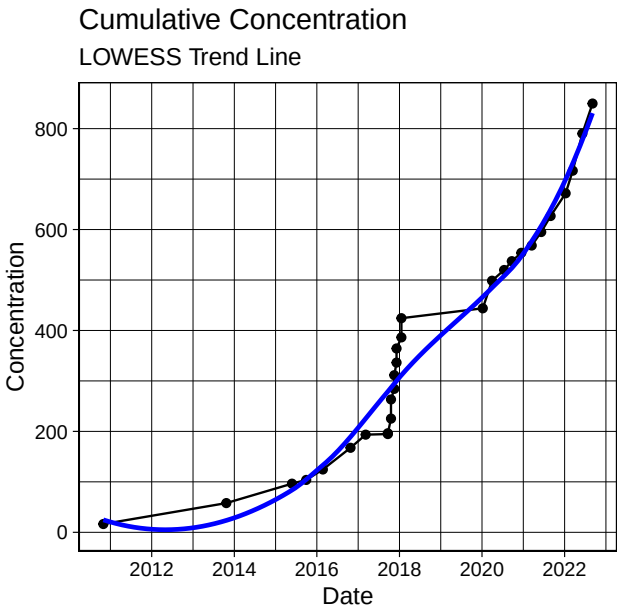




Kendall Trend Test Results Continuous	
n	29
z	1.58
p	0.12
S	85
varS	2841
tau	0.21
mean	29.3
sd	16.59
cov	0.57
results	NO CLEAR TREND

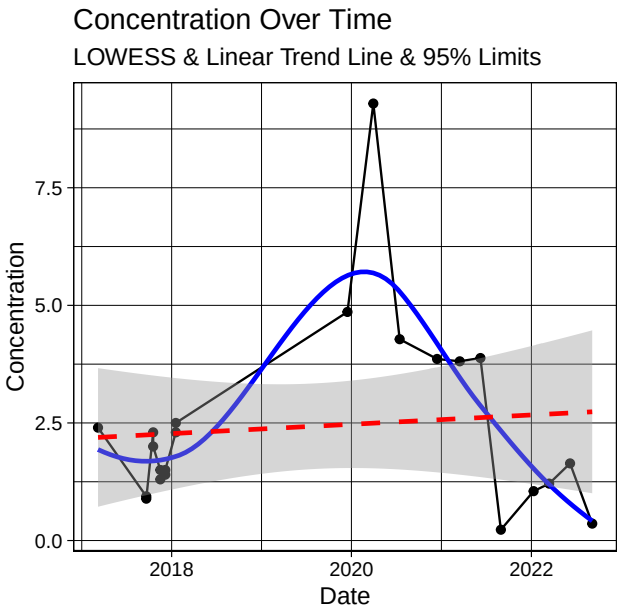
Report for ID : MW112 and Analyte : PFOS

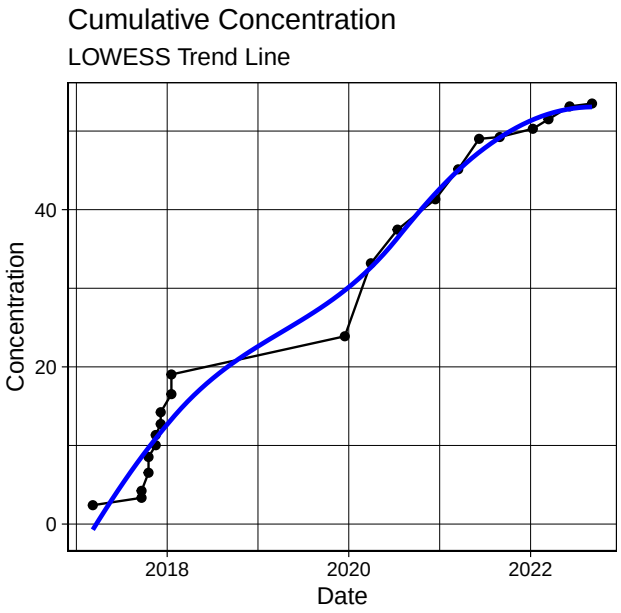




Kendall Trend Test Results Continuous	
n	22
z	0.17
p	0.87
S	7
varS	1255.67
tau	0.03
mean	2.43
sd	2.01
cov	0.82
results	NO CLEAR TREND

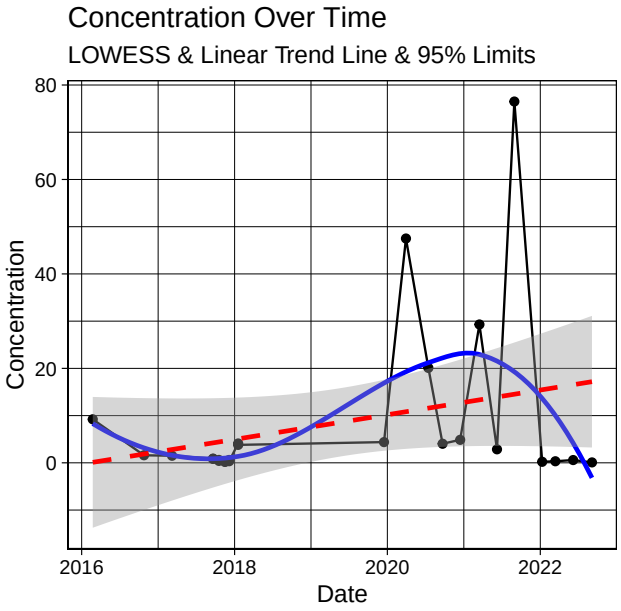
Report for ID : MW120 and Analyte : PFOS

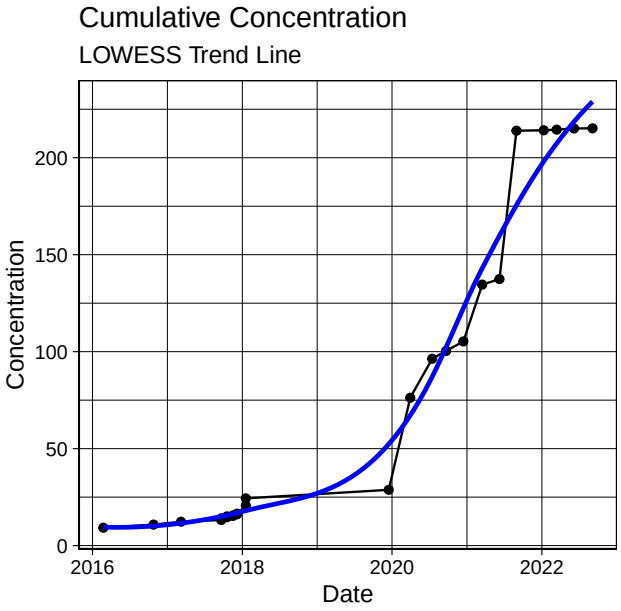




Kendall Trend Test Results Continuous	
n	25
z	-0.12
p	0.91
S	-6
varS	1833.33
tau	-0.02
mean	8.61
sd	17.92
cov	2.08
results	NO CLEAR TREND

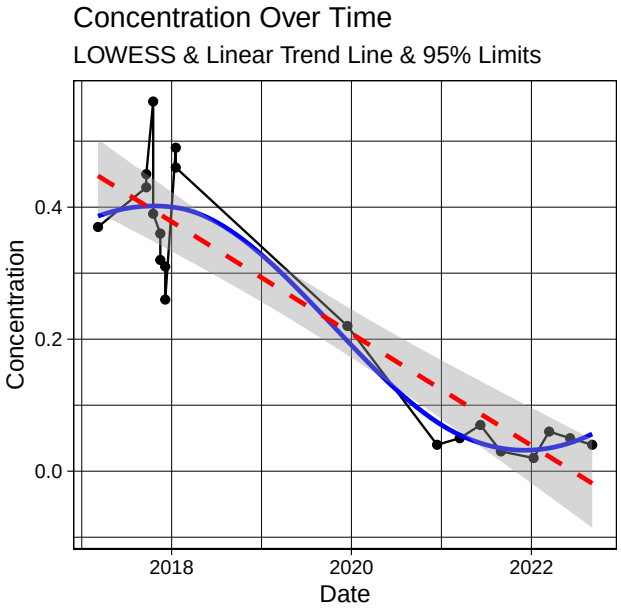
Report for ID : MW121 and Analyte : PFOS

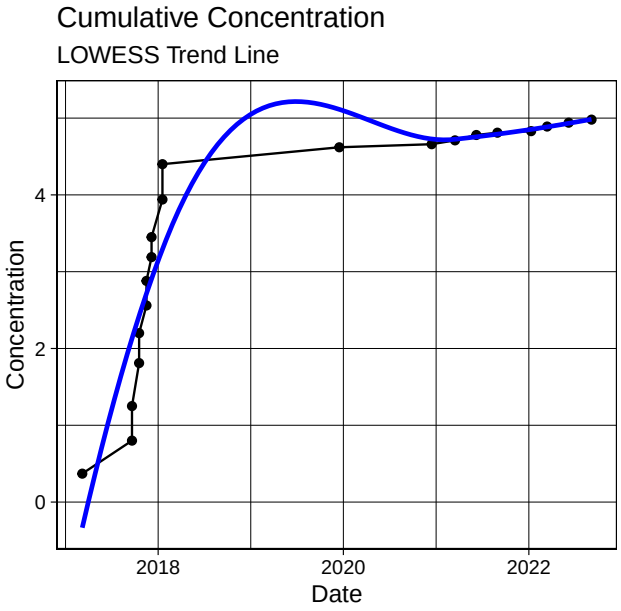




Kendall Trend Test Results Continuous	
n	20
z	-3.8
p	0
S	-118
varS	948
tau	-0.62
mean	0.25
sd	0.19
cov	0.75
results	DECREASING

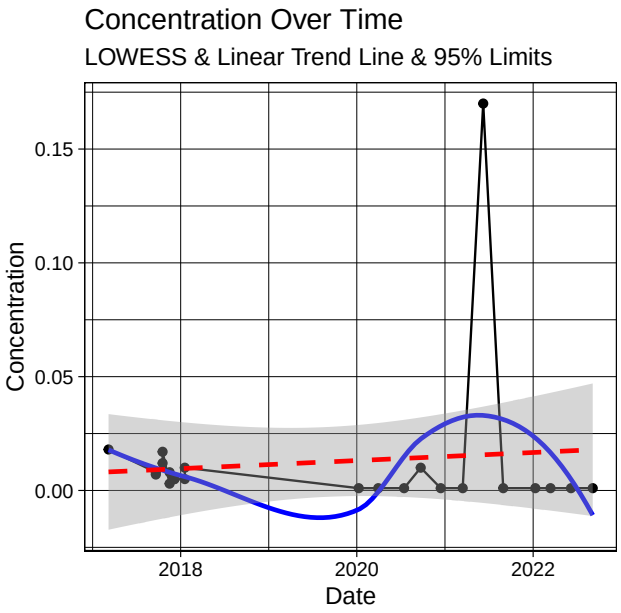
Report for ID : MW123 and Analyte : PFOS

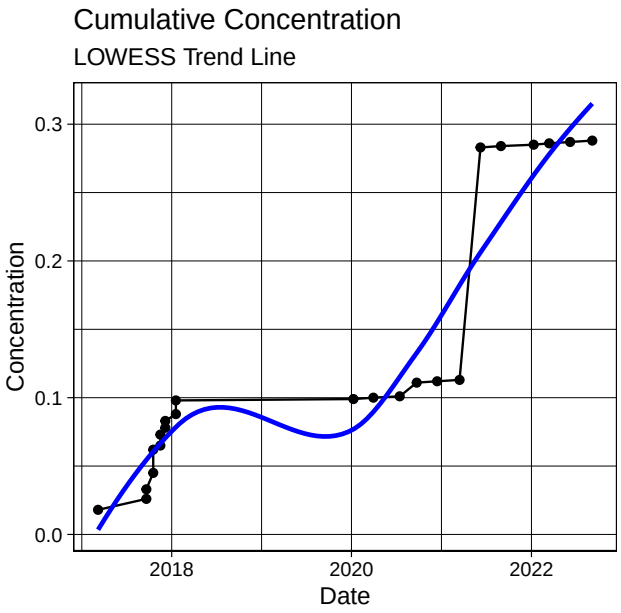




Kendall Trend Test Results Continuous	
n	23
z	-3.16
p	0
S	-115
varS	1303
tau	-0.51
mean	0.01
sd	0.03
cov	2.77
results	DECREASING

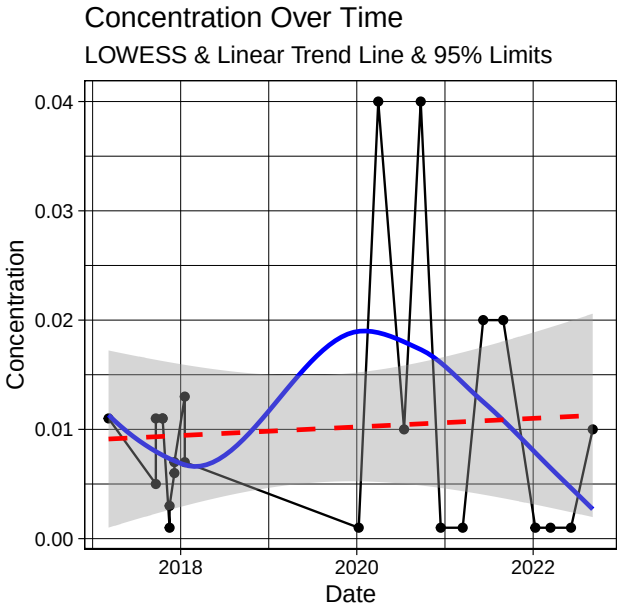
Report for ID : MW124 and Analyte : PFOS

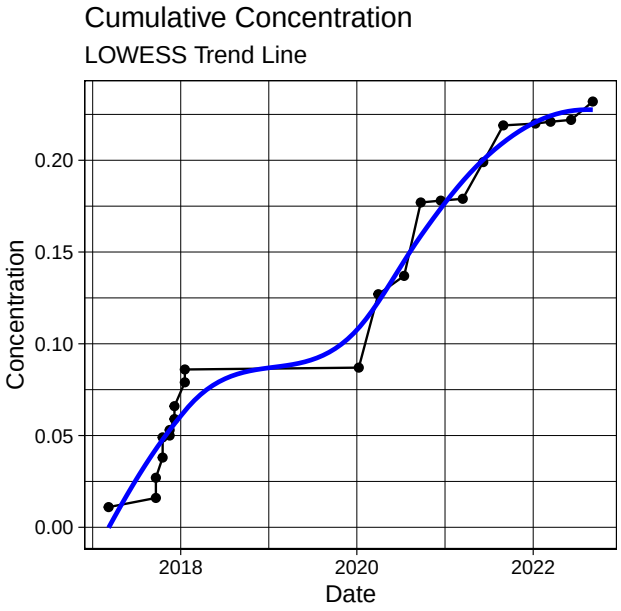




Kendall Trend Test Results Continuous	
n	23
z	-0.67
p	0.5
S	-26
varS	1376.67
tau	-0.11
mean	0.01
sd	0.01
cov	1.1
results	NO CLEAR TREND

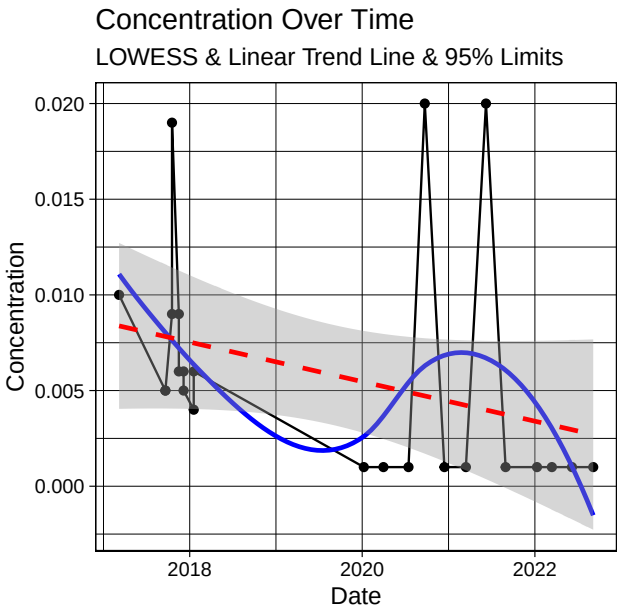
Report for ID : MW125 and Analyte : PFOS

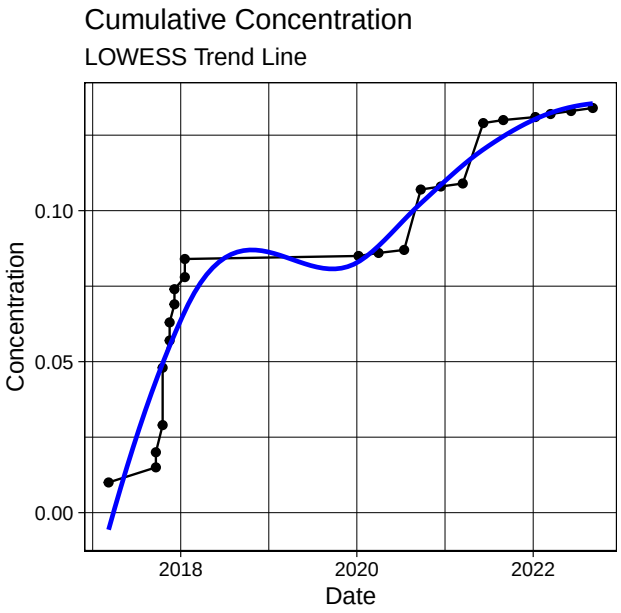




Kendall Trend Test Results Continuous	
n	23
z	-2.97
p	0
S	-108
varS	1299.33
tau	-0.48
mean	0.01
sd	0.01
cov	1.07
results	DECREASING

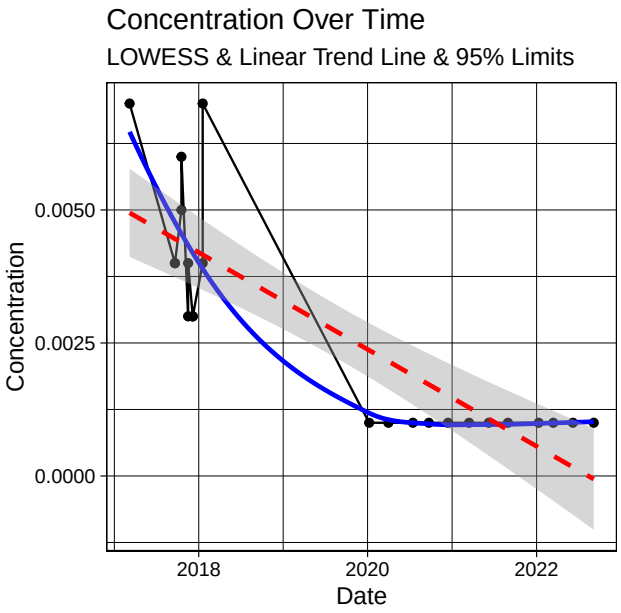
Report for ID : MW126 and Analyte : PFOS

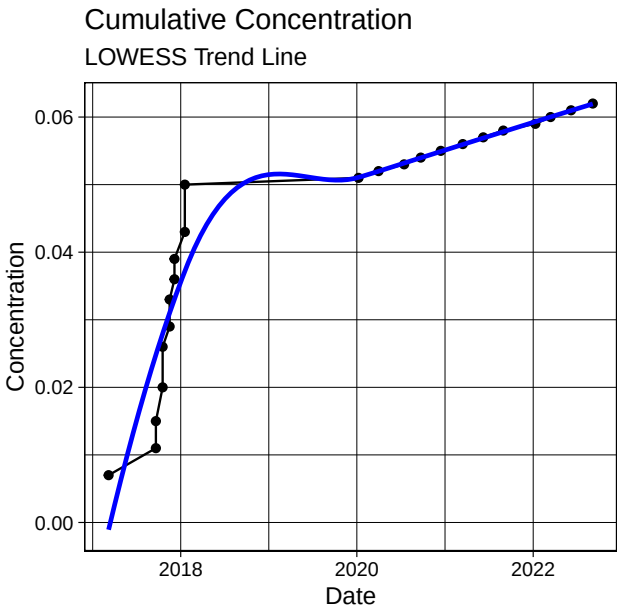




Kendall Trend Test Results Continuous	
n	23
z	-4.03
p	0
S	-141
varS	1207.67
tau	-0.67
mean	0
sd	0
cov	0.77
results	DECREASING

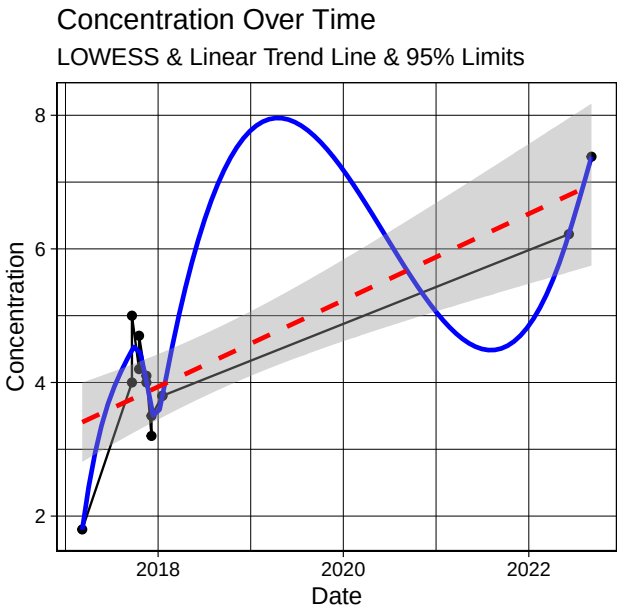
Report for ID : MW127 and Analyte : PFOS

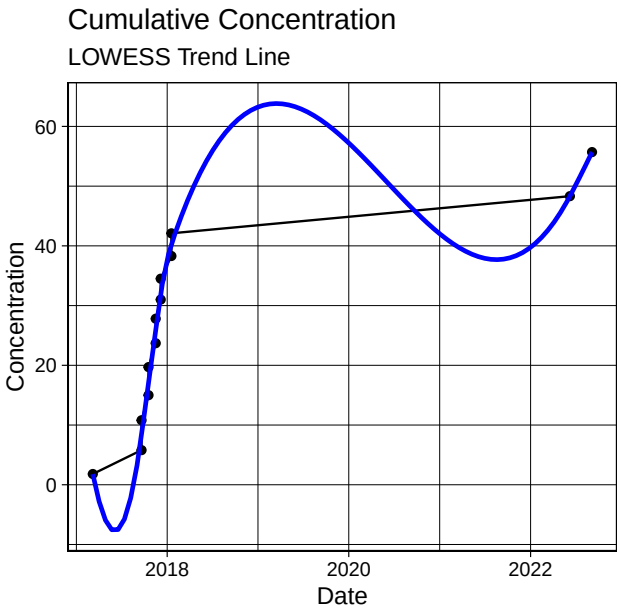




Kendall Trend Test Results Continuous	
n	13
z	0.67
p	0.5
S	12
varS	266.67
tau	0.16
mean	4.28
sd	1.37
cov	0.32
results	NO CLEAR TREND

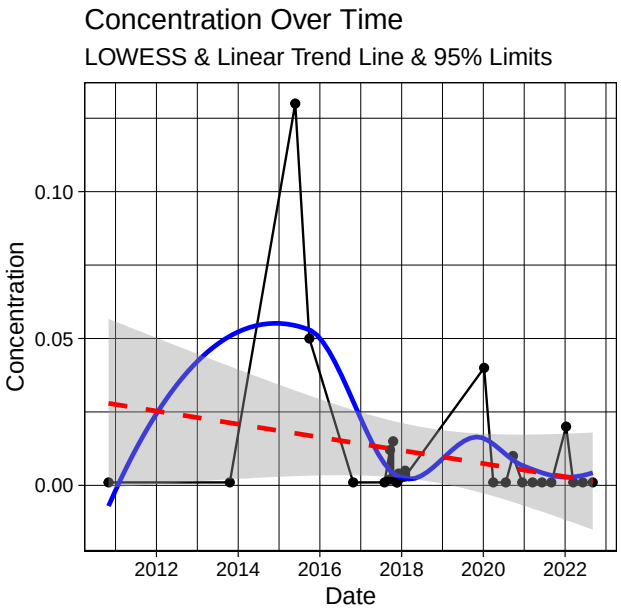
Report for ID : MW128 and Analyte : PFOS

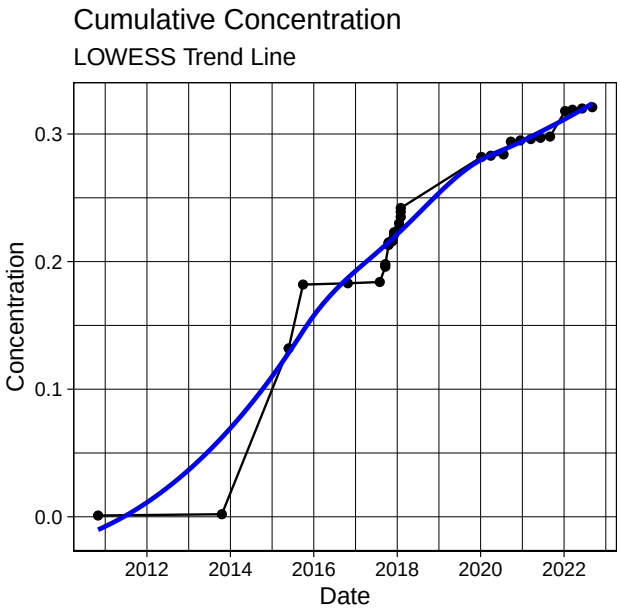




Kendall Trend Test Results Continuous	
n	31
z	-1.16
p	0.25
S	-65
varS	3045
tau	-0.16
mean	0.01
sd	0.02
cov	2.41
results	NO CLEAR TREND

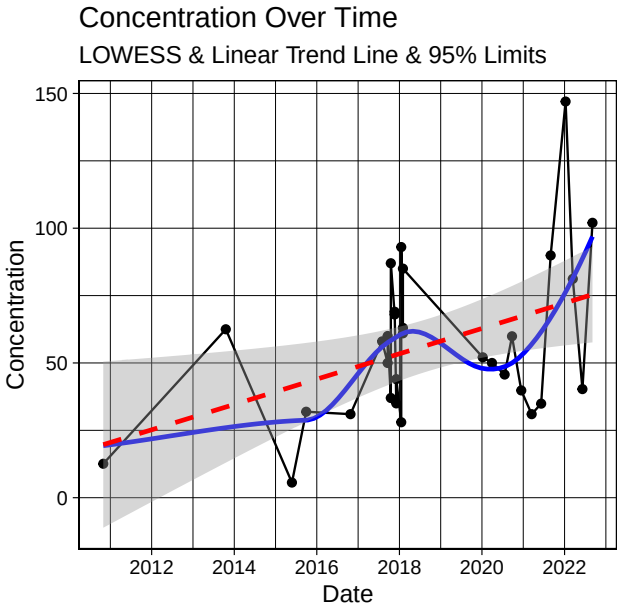
Report for ID : MW139 and Analyte : PFOS

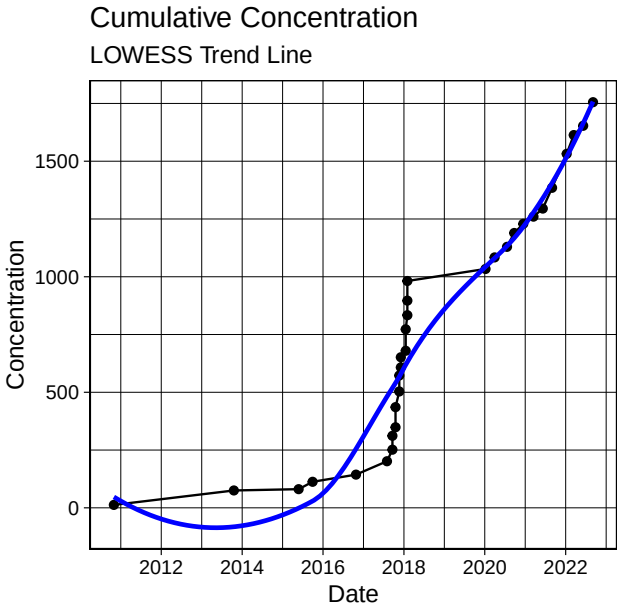




Kendall Trend Test Results Continuous	
n	31
z	1.84
p	0.07
S	109
varS	3459.67
tau	0.23
mean	56.63
sd	28.83
cov	0.51
results	POSSIBLY INCREASING

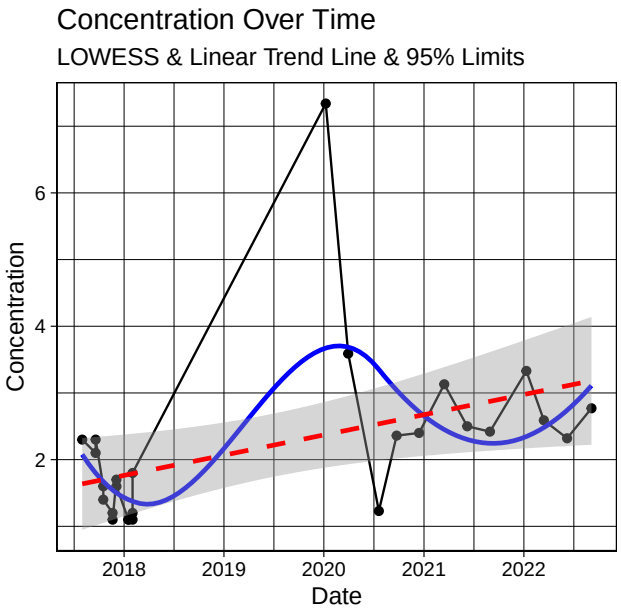
Report for ID : MW141 and Analyte : PFOS

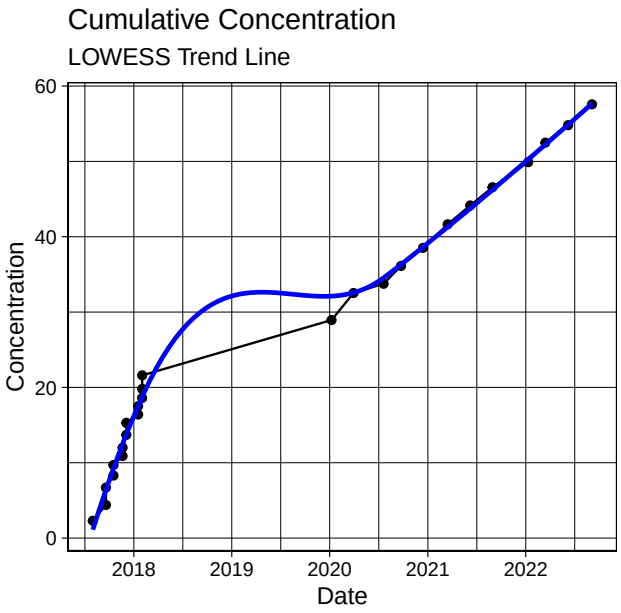




Kendall Trend Test Results Continuous	
n	26
z	2.41
p	0.02
S	110
varS	2046.67
tau	0.34
mean	2.21
sd	1.28
cov	0.58
results	INCREASING

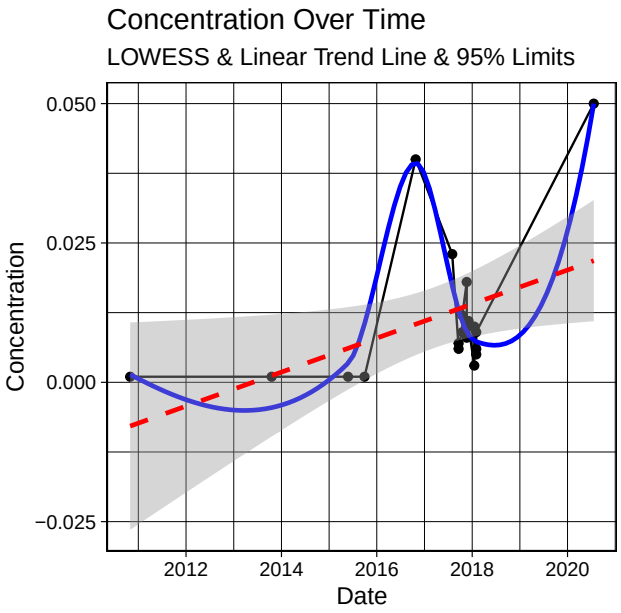
Report for ID : MW142 and Analyte : PFOS

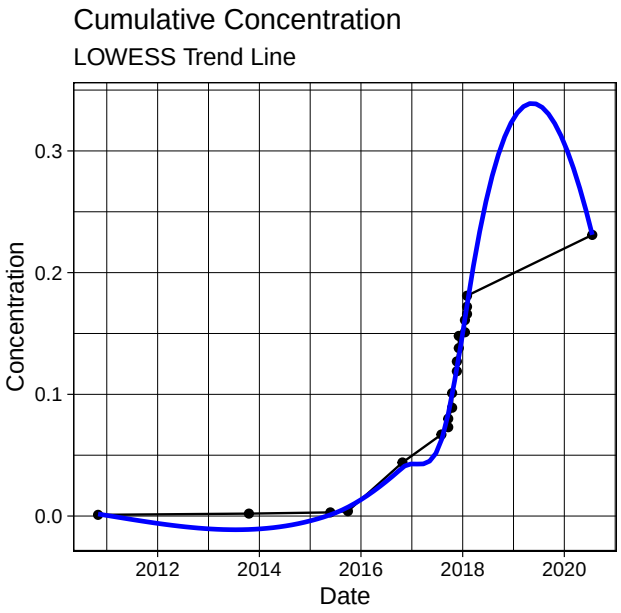




Kendall Trend Test Results Continuous	
n	20
z	1.44
p	0.15
S	45
varS	938.33
tau	0.24
mean	0.01
sd	0.01
cov	1.11
results	NO CLEAR TREND

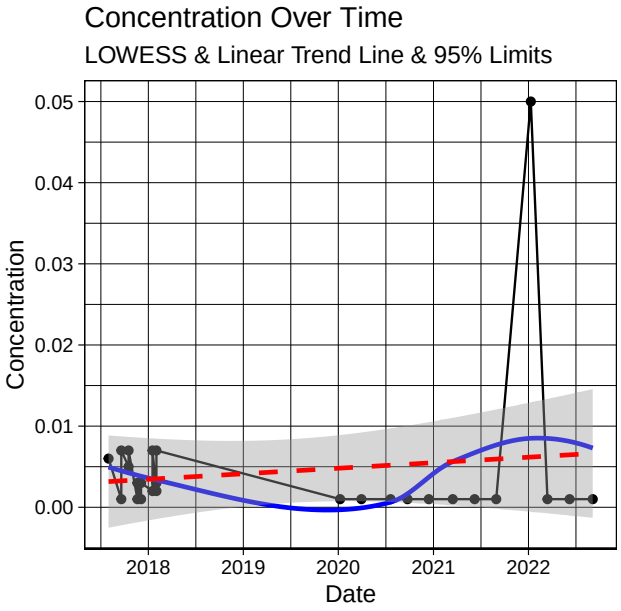
Report for ID : MW147 and Analyte : PFOS

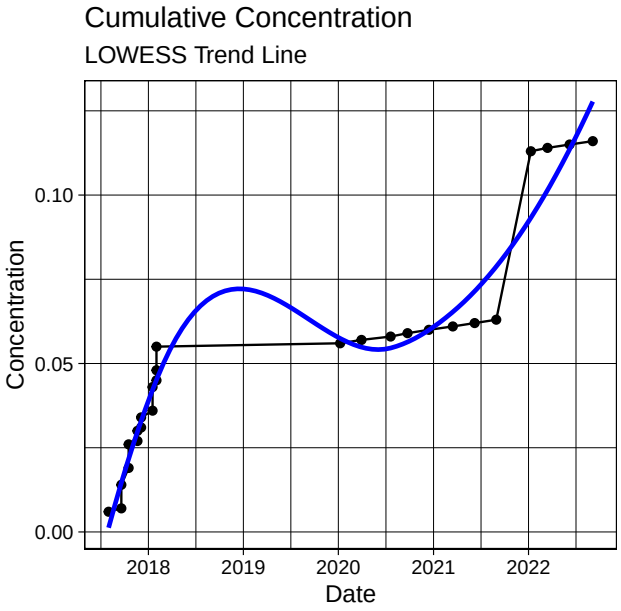




Kendall Trend Test Results Continuous	
n	26
z	-2.39
p	0.02
S	-100
varS	1711.33
tau	-0.37
mean	0
sd	0.01
cov	2.14
results	DECREASING

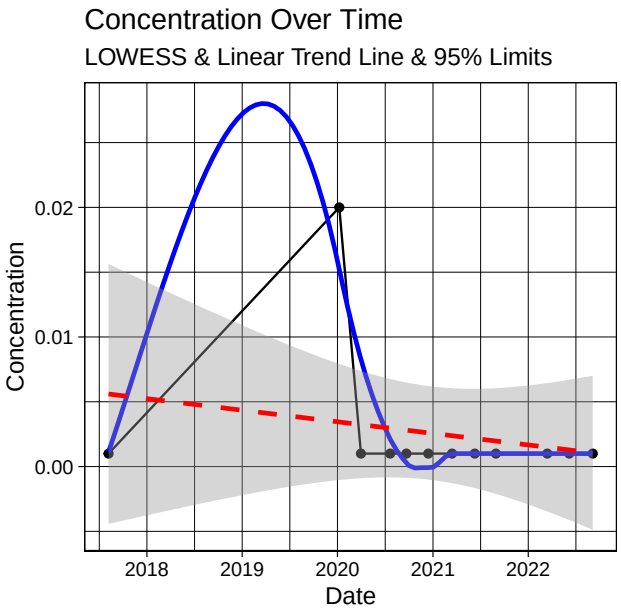
Report for ID : MW149 and Analyte : PFOS

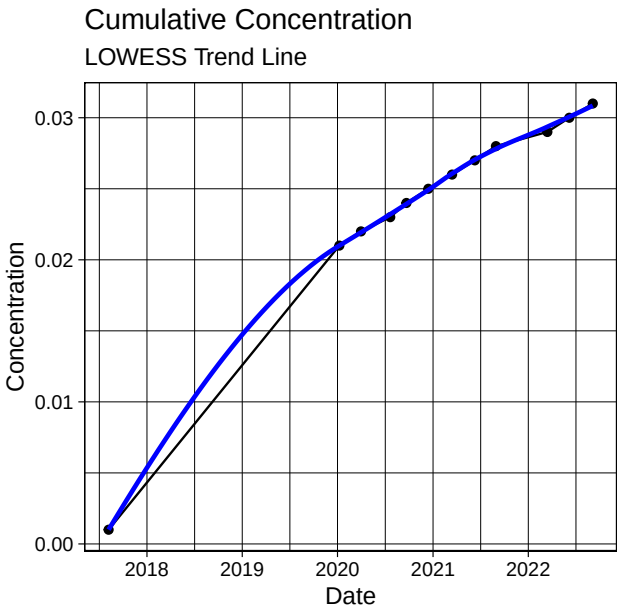




Kendall Trend Test Results Continuous	
n	12
z	-1.16
p	0.25
S	-9
varS	47.67
tau	-0.33
mean	0
sd	0.01
cov	2.12
results	NO CLEAR TREND

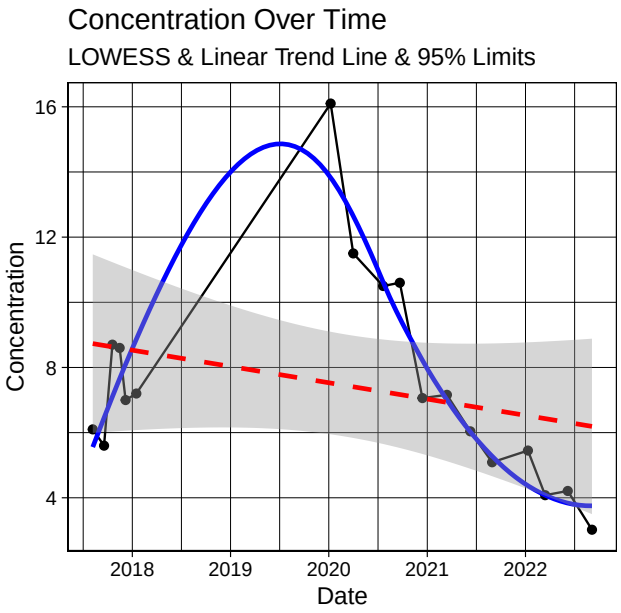
Report for ID : MW158 and Analyte : PFOS

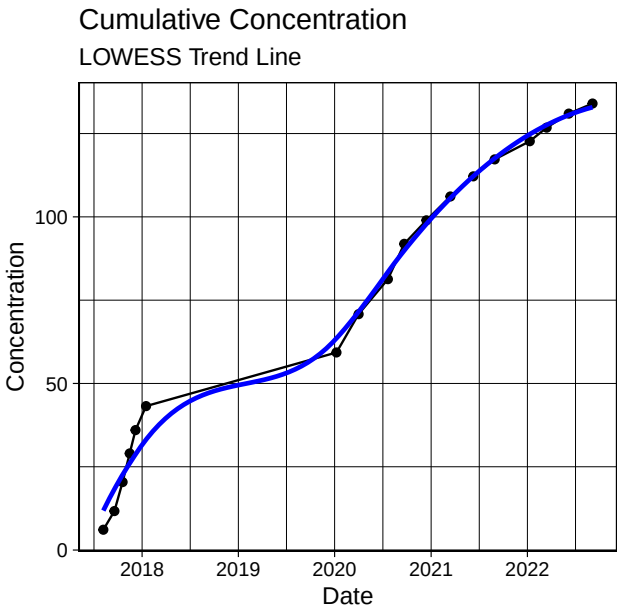




Kendall Trend Test Results Continuous	
n	18
z	-2.42
p	0.02
S	-65
varS	697
tau	-0.42
mean	7.44
sd	3.18
cov	0.43
results	DECREASING

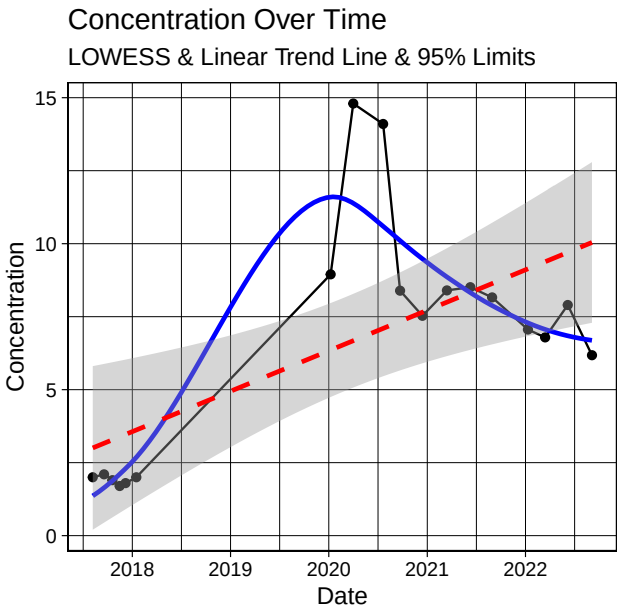
Report for ID : MW161 and Analyte : PFOS

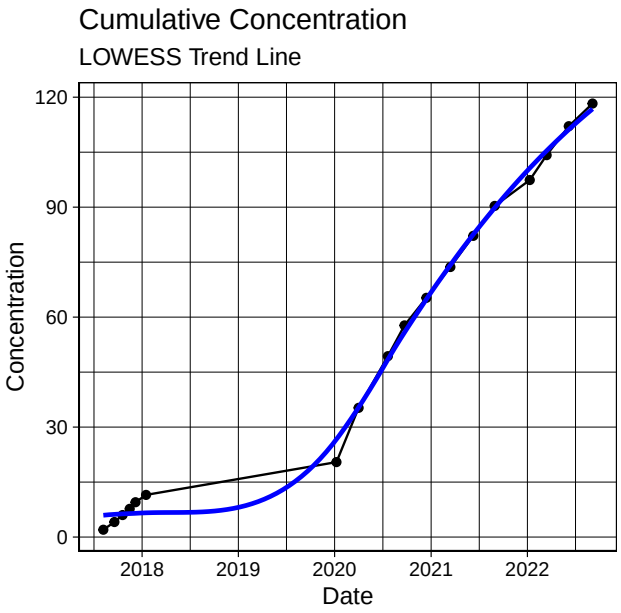




Kendall Trend Test Results Continuous	
n	18
z	0.87
p	0.38
S	24
varS	696
tau	0.16
mean	6.57
sd	4.03
cov	0.61
results	NO CLEAR TREND

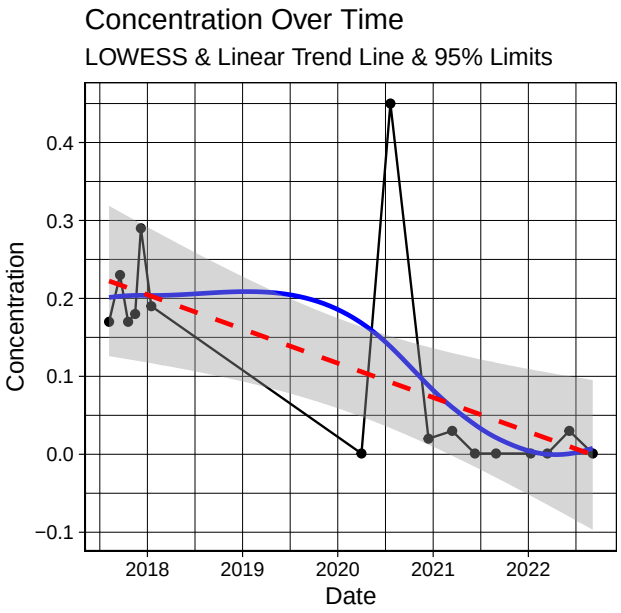
Report for ID : MW166 and Analyte : PFOS

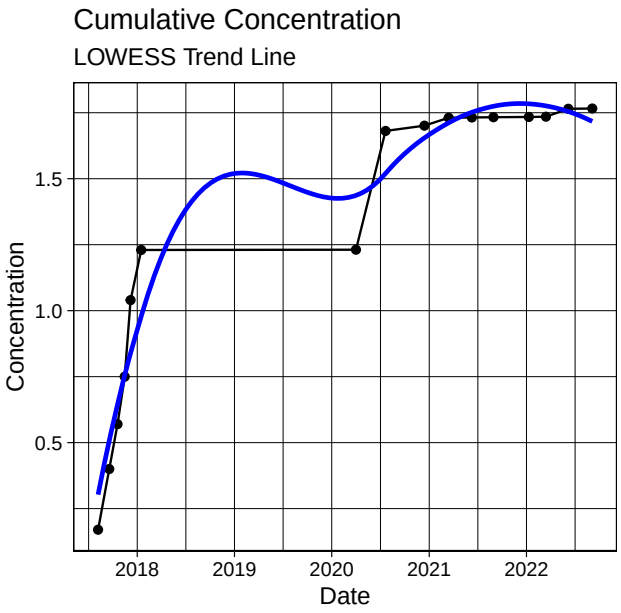




Kendall Trend Test Results Continuous	
n	16
z	-2.32
p	0.02
S	-51
varS	463
tau	-0.46
mean	0.11
sd	0.13
cov	1.22
results	DECREASING

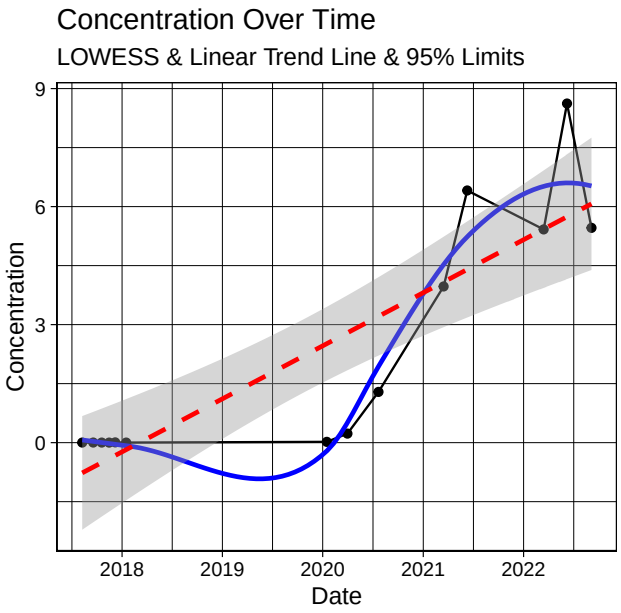
Report for ID : MW171 and Analyte : PFOS

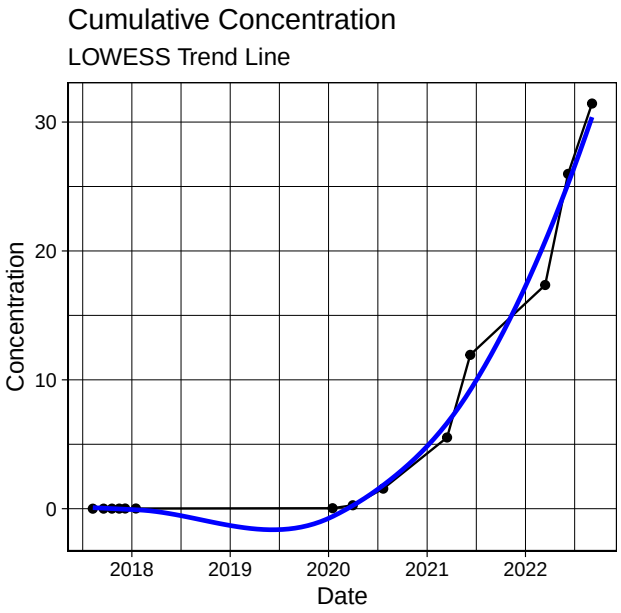




Kendall Trend Test Results Continuous	
n	14
z	3.8
p	0
S	70
varS	330
tau	0.78
mean	2.25
sd	3.06
cov	1.36
results	INCREASING

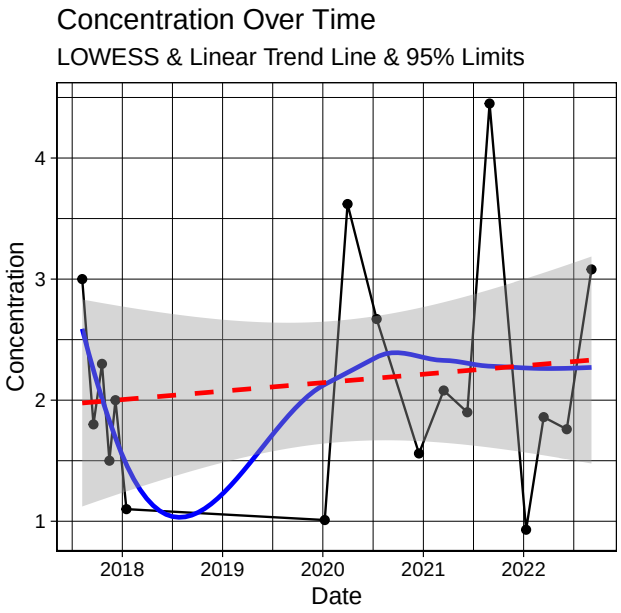
Report for ID : MW173 and Analyte : PFOS

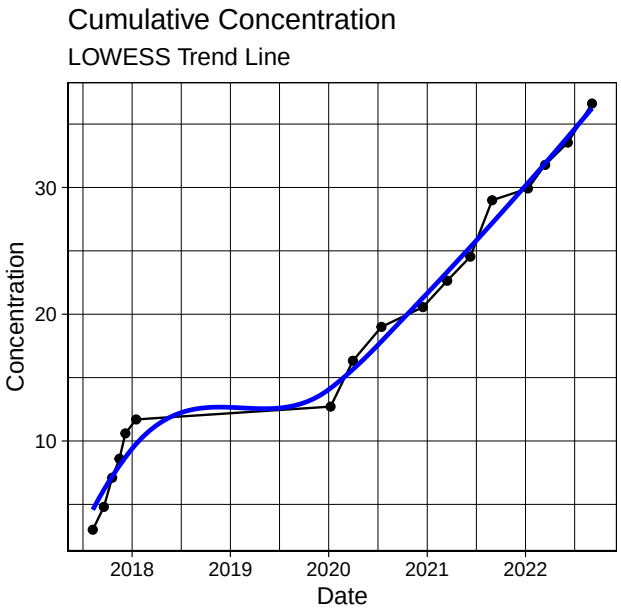




Kendall Trend Test Results Continuous	
n	17
z	-0.04
p	0.97
S	-2
varS	589.33
tau	-0.01
mean	2.15
sd	0.95
cov	0.44
results	STABLE

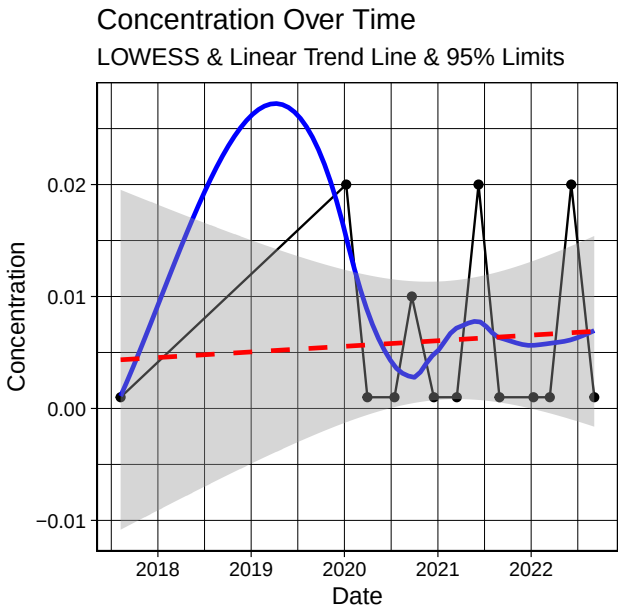
Report for ID : MW193 and Analyte : PFOS

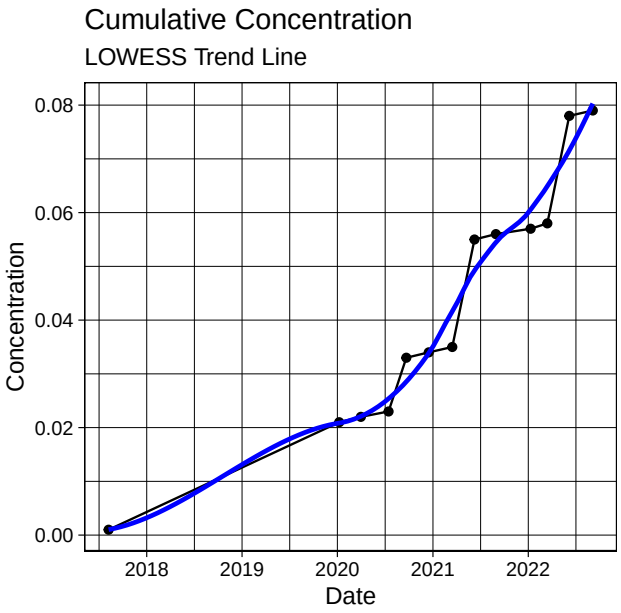




Kendall Trend Test Results Continuous	
n	13
z	0
p	1
S	-1
varS	173
tau	-0.02
mean	0.01
sd	0.01
cov	1.37
results	NO CLEAR TREND

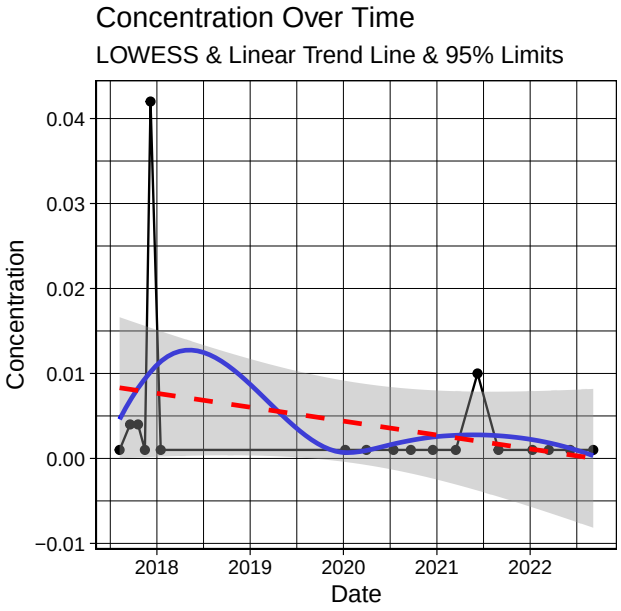
Report for ID : MW195D and Analyte : PFOS

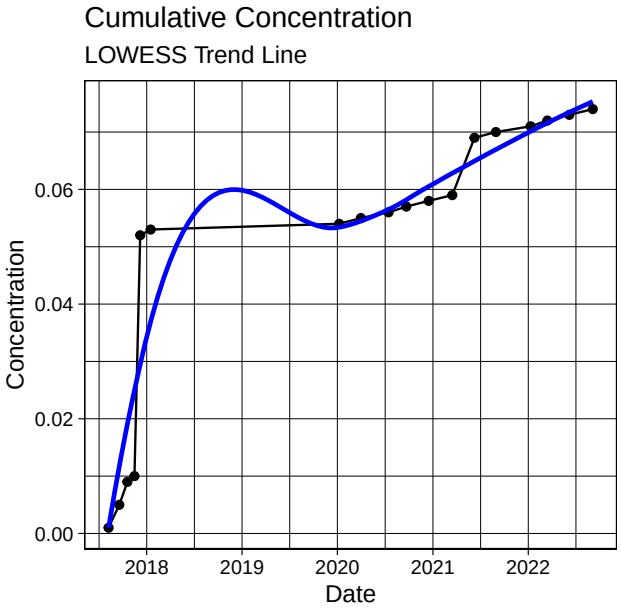




Kendall Trend Test Results Continuous	
n	18
z	-1.37
p	0.17
S	-27
varS	362.33
tau	-0.28
mean	0
sd	0.01
cov	2.36
results	NO CLEAR TREND

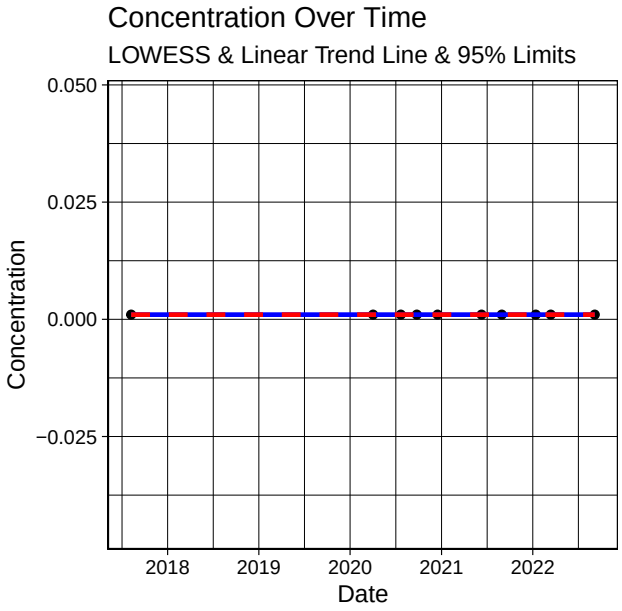
Report for ID : MW195S and Analyte : PFOS

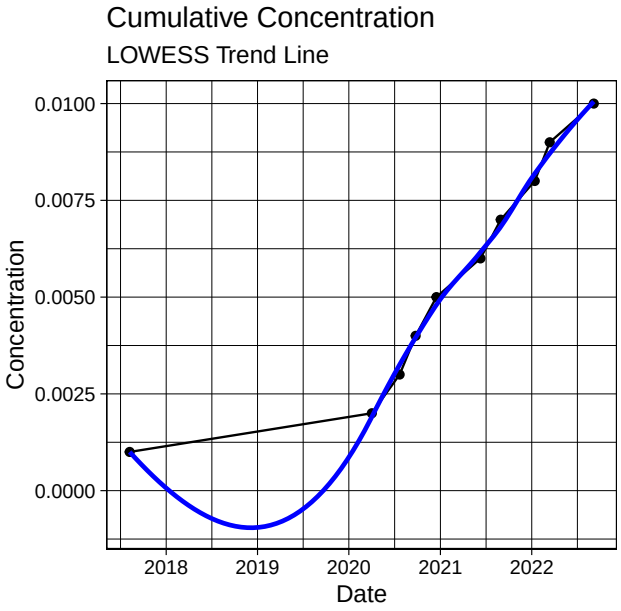




Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

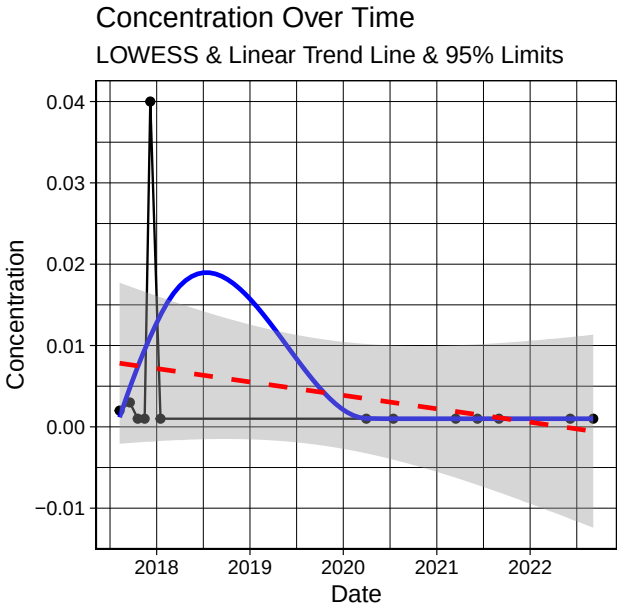
Report for ID : MW196 and Analyte : PFOS

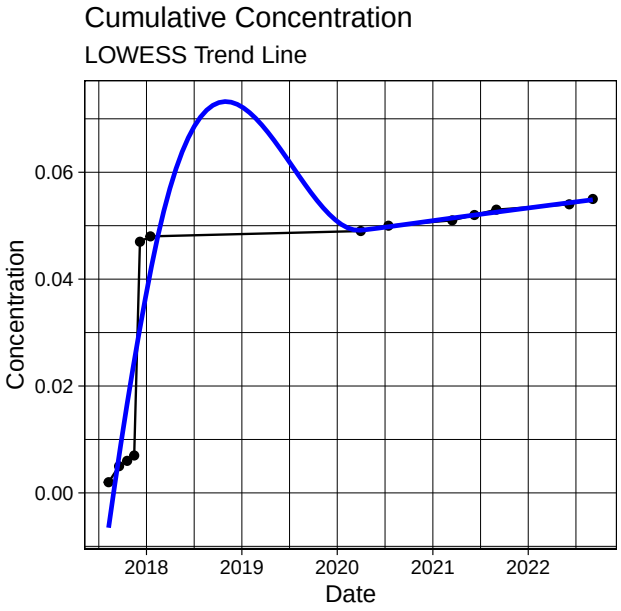




Kendall Trend Test Results Continuous	
n	13
z	-1.84
p	0.07
S	-23
varS	143.67
tau	-0.45
mean	0
sd	0.01
cov	2.54
results	POSSIBLY DECREASING

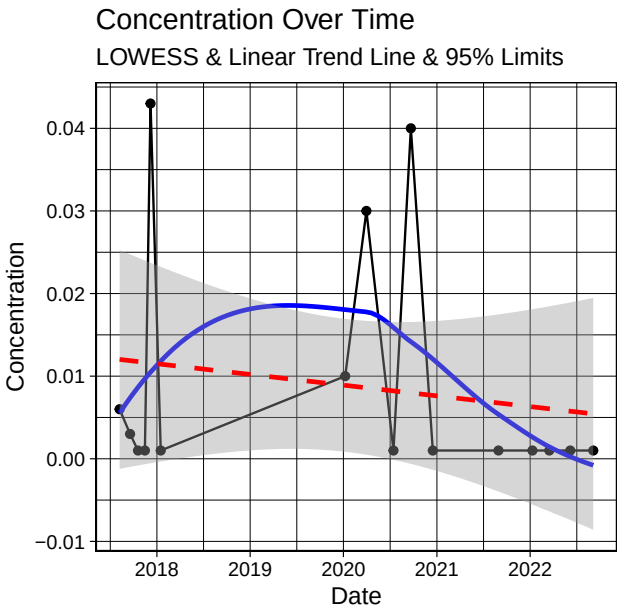
Report for ID : MW197 and Analyte : PFOS

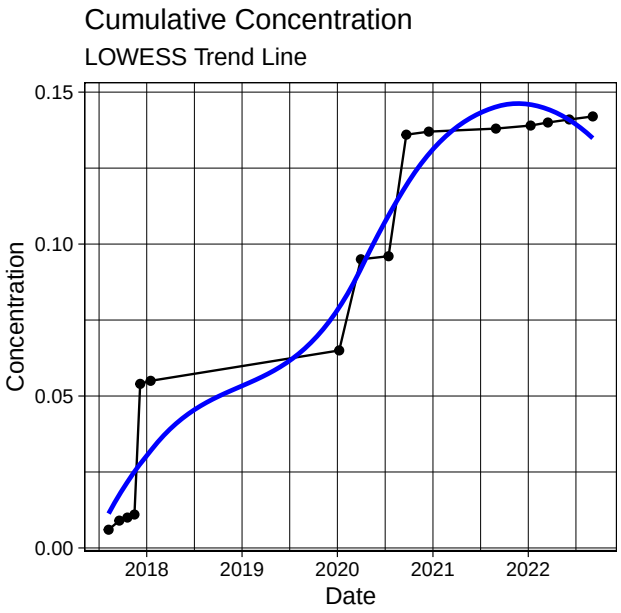




Kendall Trend Test Results Continuous	
n	16
z	-1.46
p	0.14
S	-29
varS	368.33
tau	-0.31
mean	0.01
sd	0.01
cov	1.66
results	NO CLEAR TREND

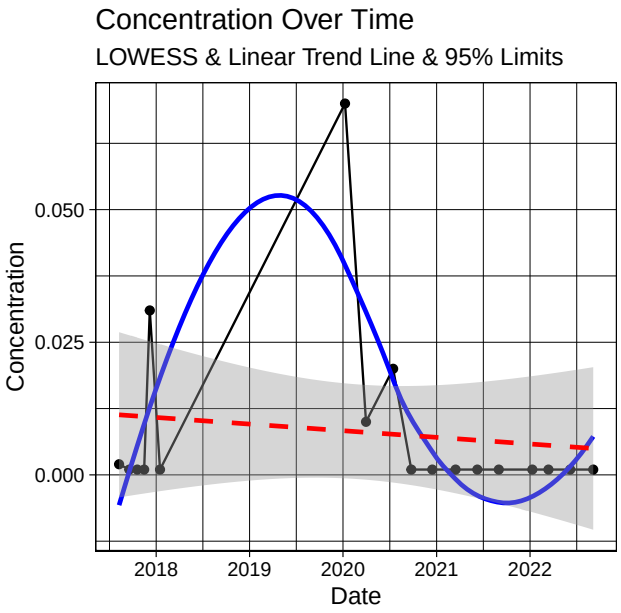
Report for ID : MW199 and Analyte : PFOS

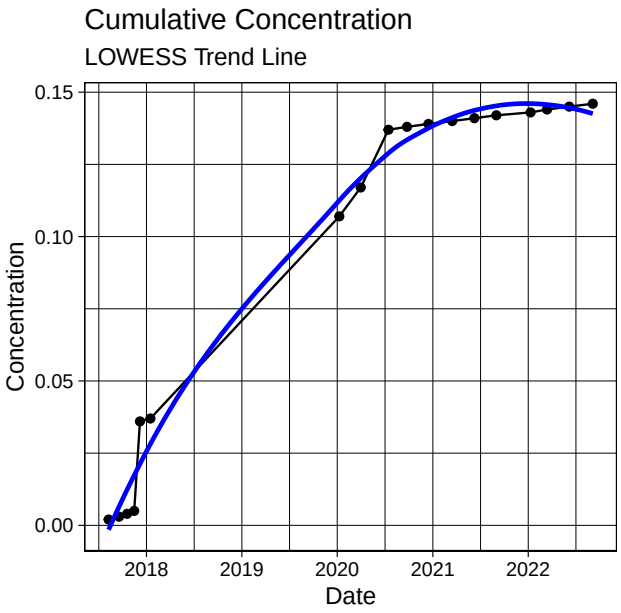




Kendall Trend Test Results Continuous	
n	18
z	-1.55
p	0.12
S	-33
varS	428.33
tau	-0.31
mean	0.01
sd	0.02
cov	2.15
results	NO CLEAR TREND

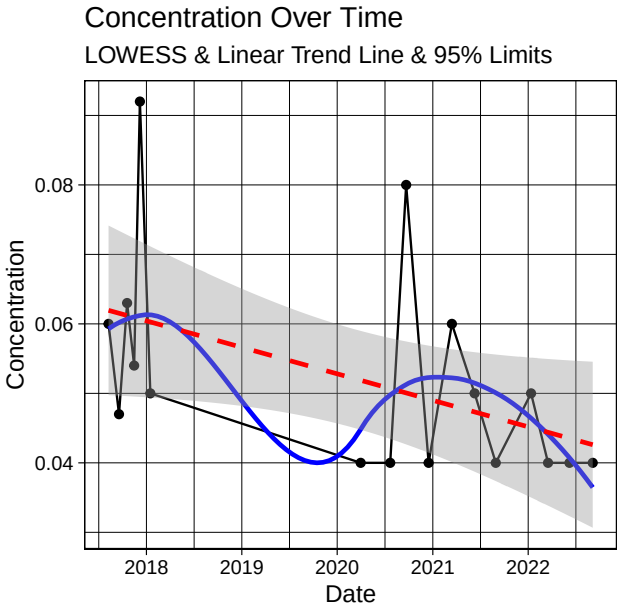
Report for ID : MW200 and Analyte : PFOS

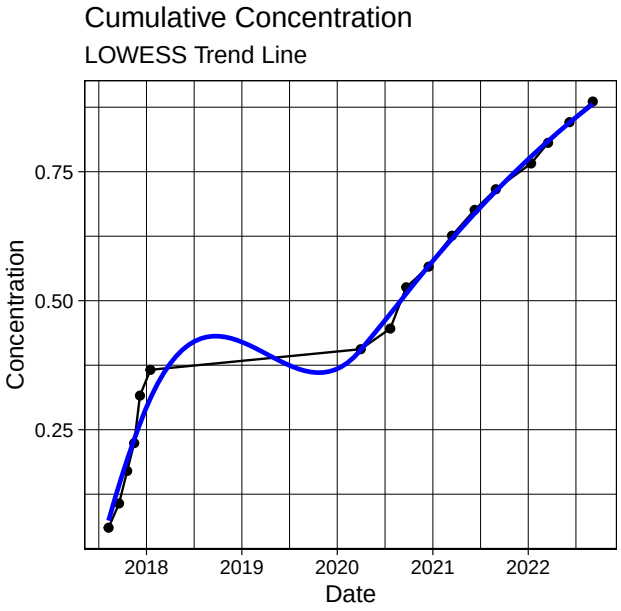




Kendall Trend Test Results Continuous	
n	17
z	-2.15
p	0.03
S	-51
varS	540.33
tau	-0.42
mean	0.05
sd	0.02
cov	0.29
results	DECREASING

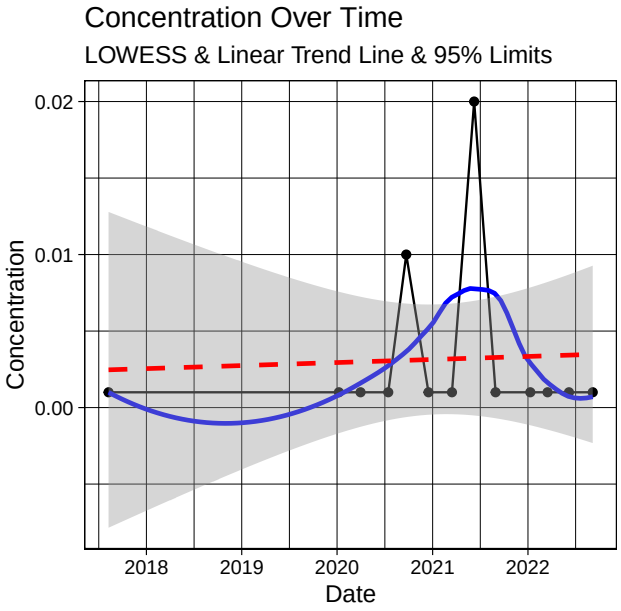
Report for ID : MW202 and Analyte : PFOS

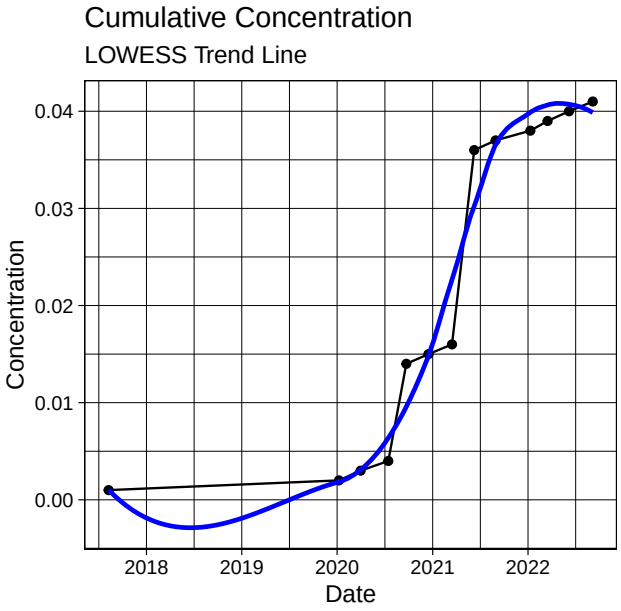




Kendall Trend Test Results Continuous	
n	13
z	0
p	1
S	-1
varS	103.67
tau	-0.02
mean	0
sd	0.01
cov	1.79
results	NO CLEAR TREND

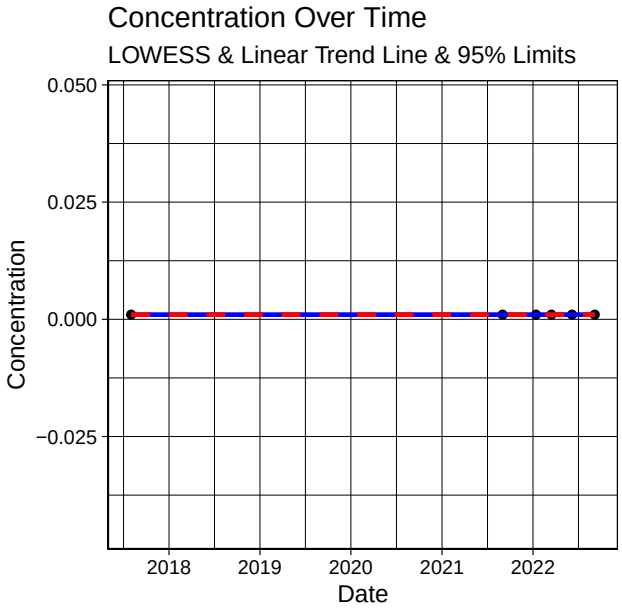
Report for ID : MW203 and Analyte : PFOS

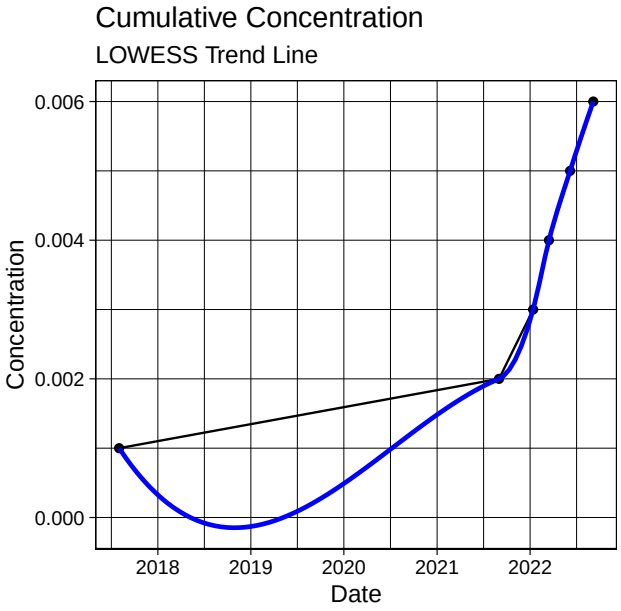




Kendall Trend Test Results Continuous	
n	6
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

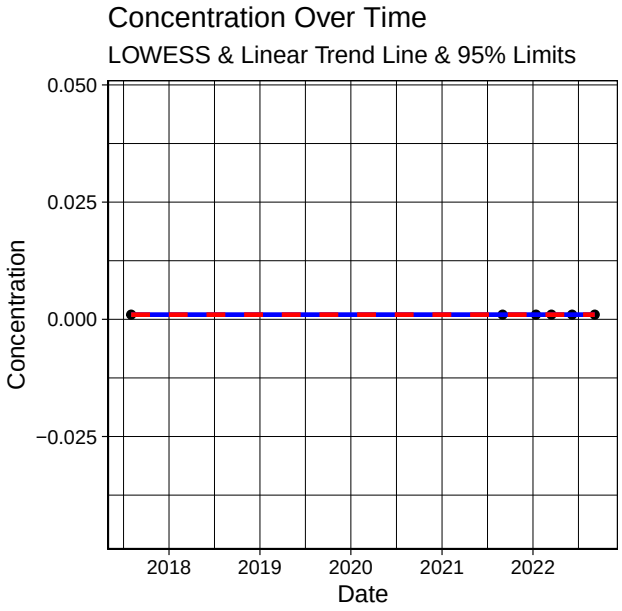
Report for ID : MW214 and Analyte : PFOS

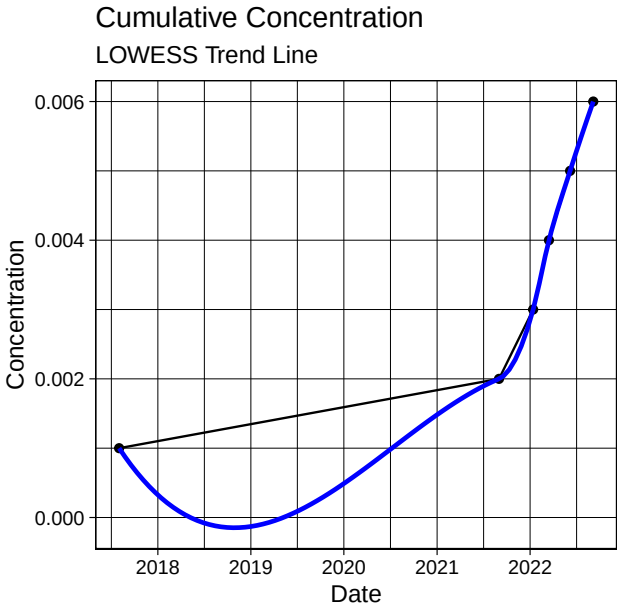




Kendall Trend Test Results Continuous	
n	6
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

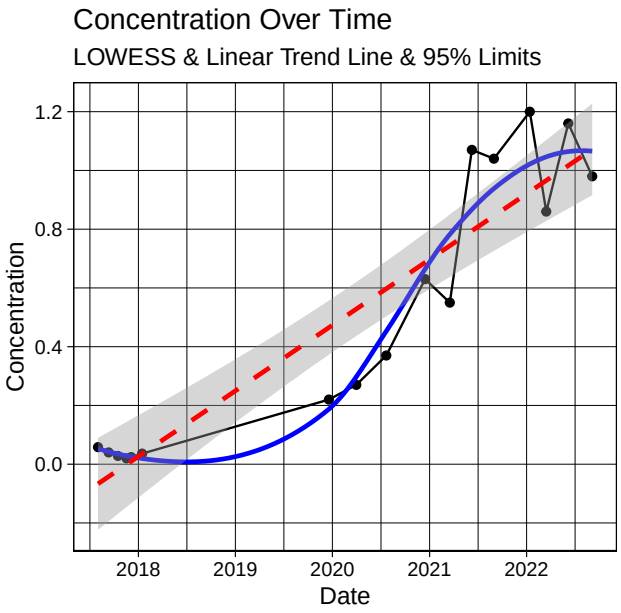
Report for ID : MW215 and Analyte : PFOS

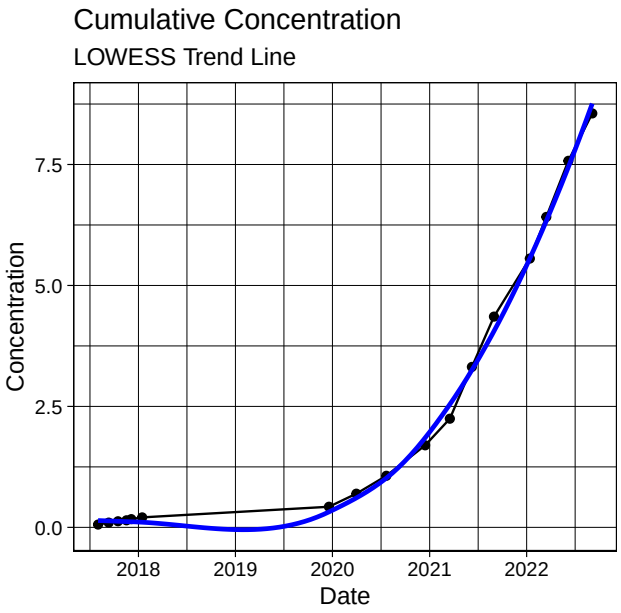




Kendall Trend Test Results Continuous	
n	17
z	3.83
p	0
S	94
varS	589.33
tau	0.69
mean	0.5
sd	0.46
cov	0.91
results	INCREASING

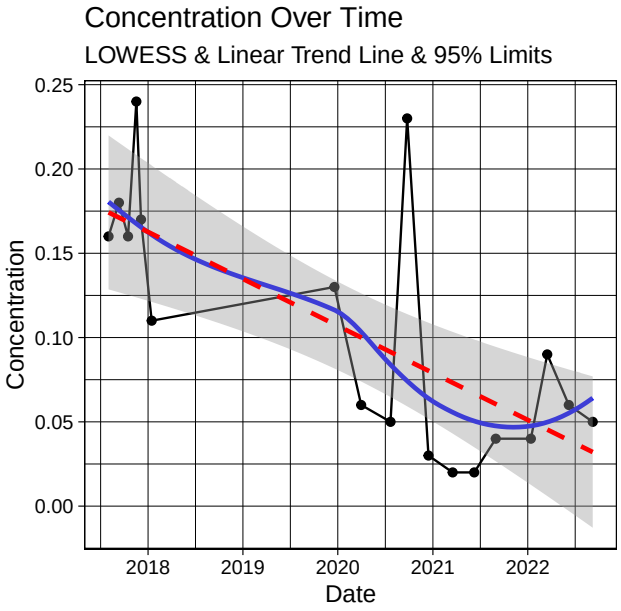
Report for ID : MW216 and Analyte : PFOS

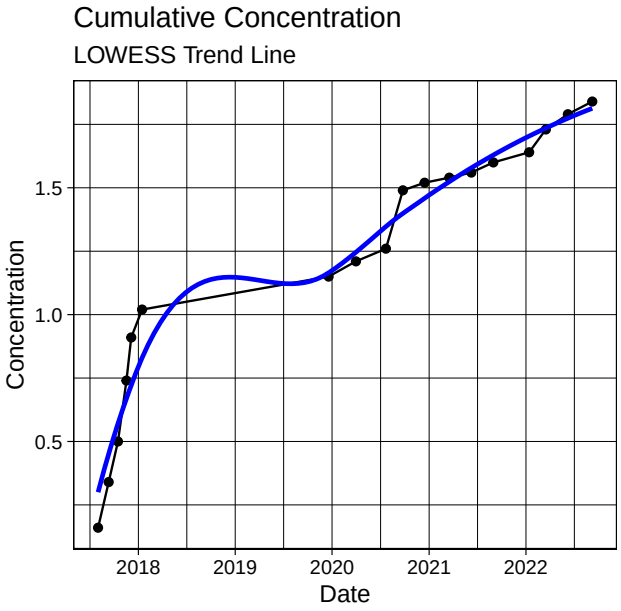




Kendall Trend Test Results Continuous	
n	18
z	-2.62
p	0.01
S	-70
varS	692
tau	-0.47
mean	0.1
sd	0.07
cov	0.71
results	DECREASING

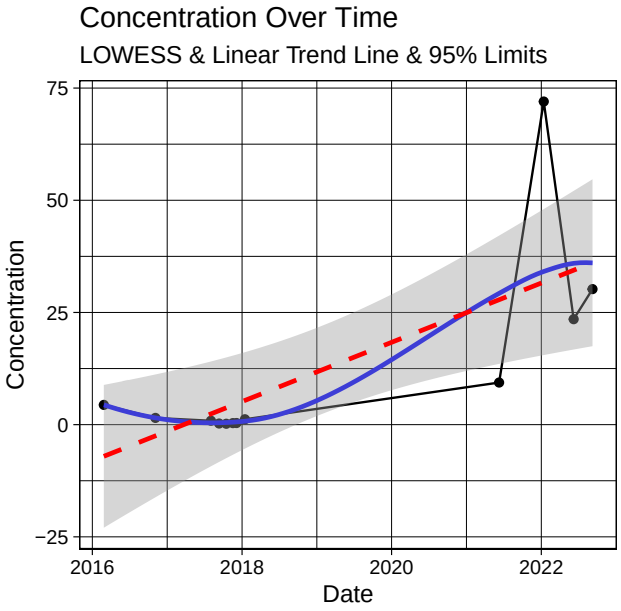
Report for ID : MW217 and Analyte : PFOS

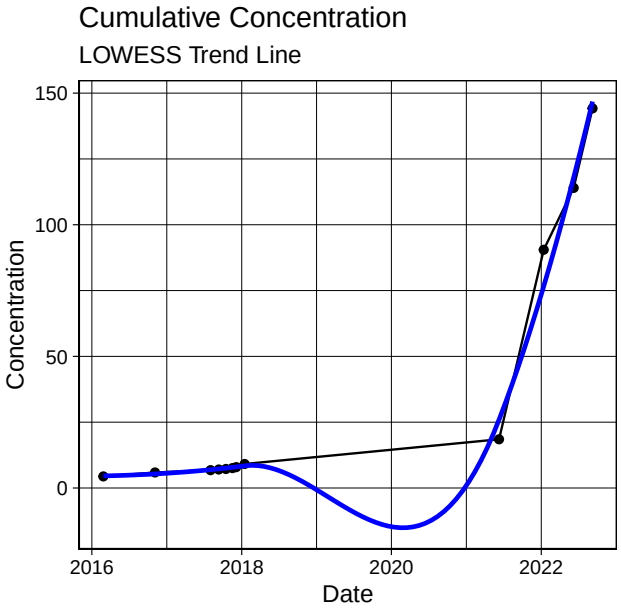




Kendall Trend Test Results Continuous	
n	12
z	1.71
p	0.09
S	26
varS	212.67
tau	0.39
mean	12.02
sd	21.38
cov	1.78
results	POSSIBLY INCREASING

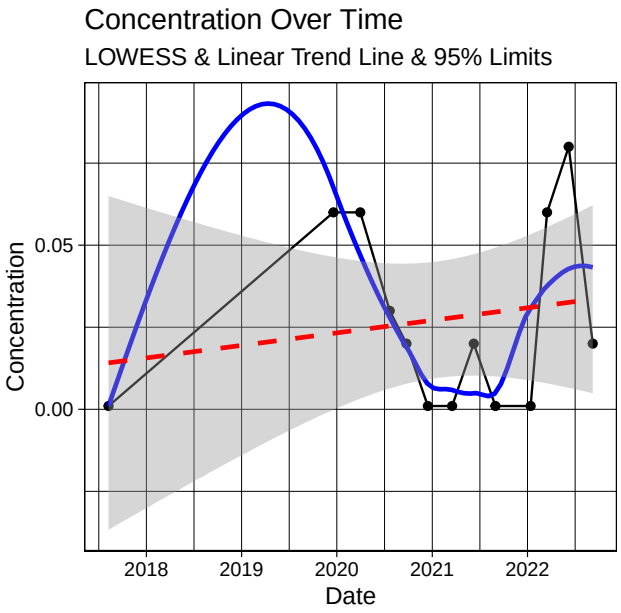
Report for ID : MW220 and Analyte : PFOS

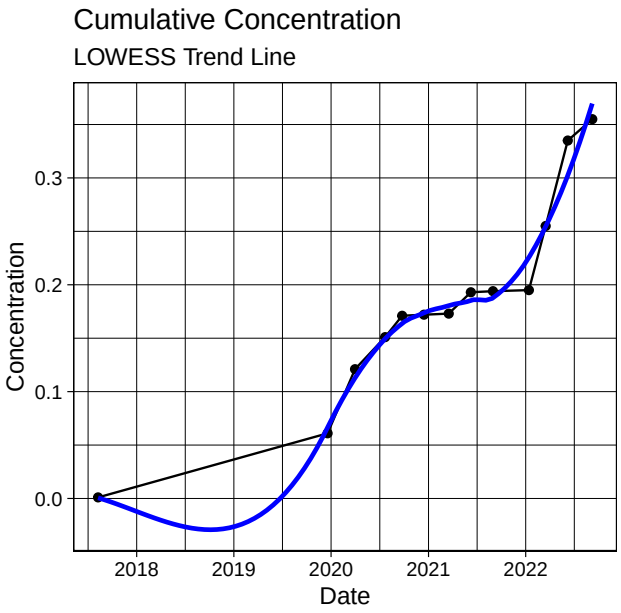




Kendall Trend Test Results Continuous	
n	13
z	0
p	1
S	0
varS	244.67
tau	0
mean	0.03
sd	0.03
cov	1.04
results	NO CLEAR TREND

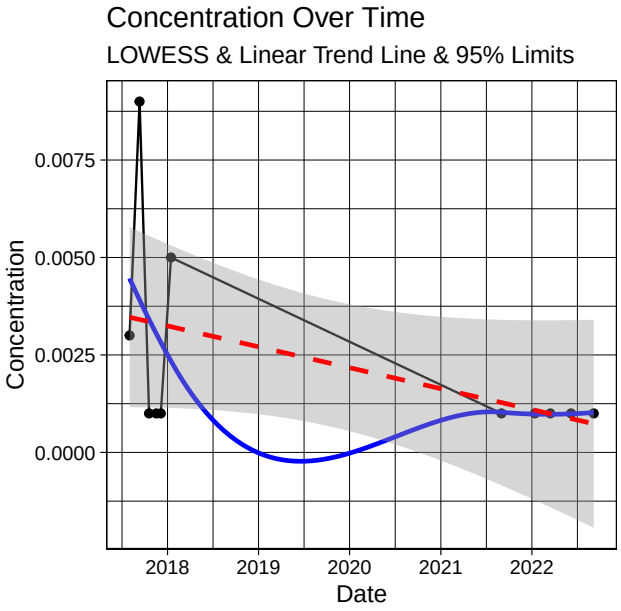
Report for ID : MW224 and Analyte : PFOS

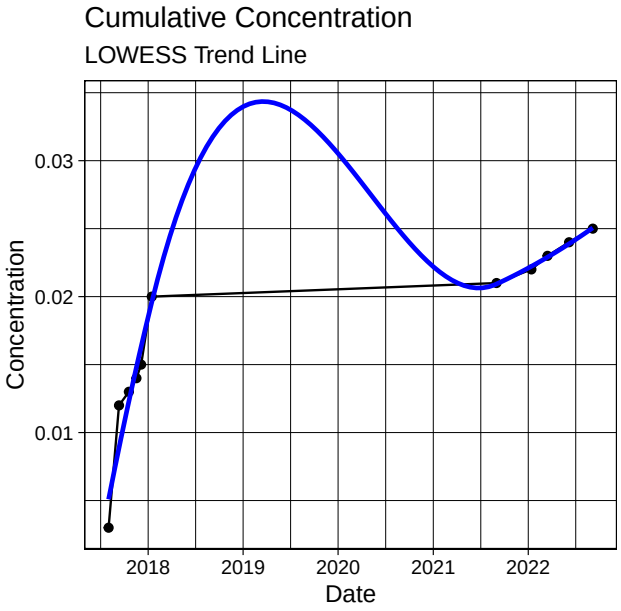




Kendall Trend Test Results Continuous	
n	11
z	-1.6
p	0.11
S	-17
varS	99.67
tau	-0.44
mean	0
sd	0
cov	1.13
results	NO CLEAR TREND

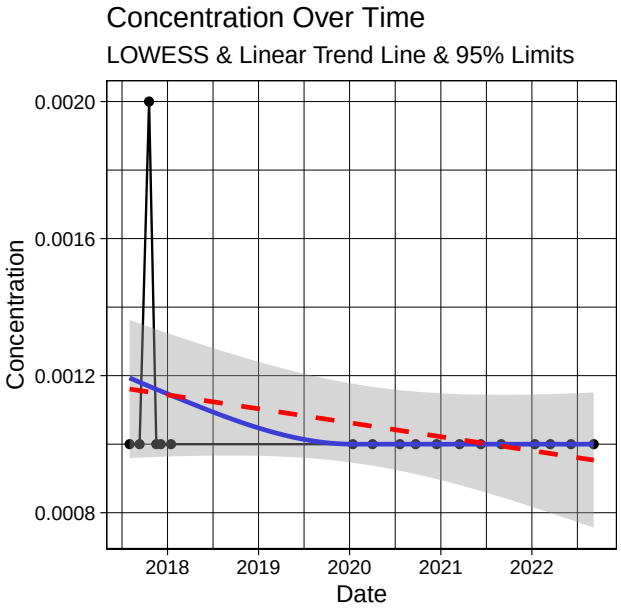
Report for ID : MW225 and Analyte : PFOS

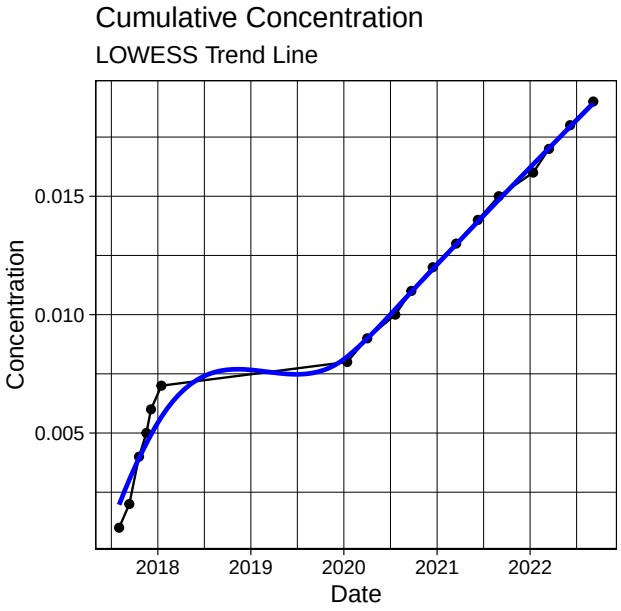




Kendall Trend Test Results Continuous	
n	18
z	-1.16
p	0.25
S	-13
varS	107.67
tau	-0.25
mean	0
sd	0
cov	0.22
results	STABLE

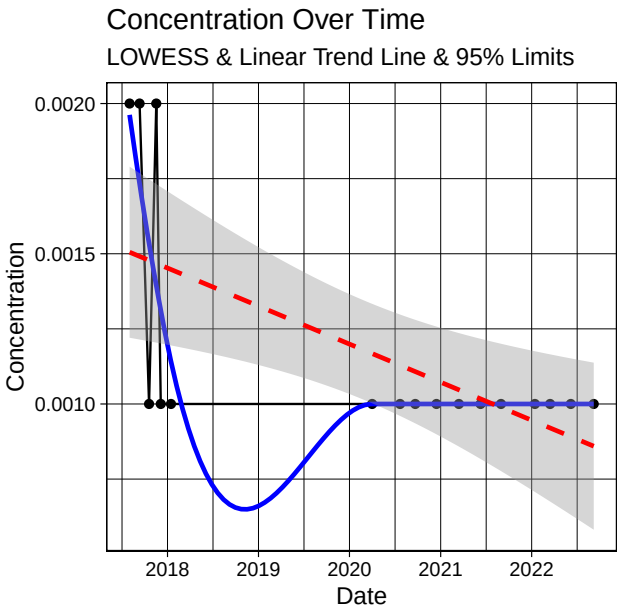
Report for ID : MW226 and Analyte : PFOS

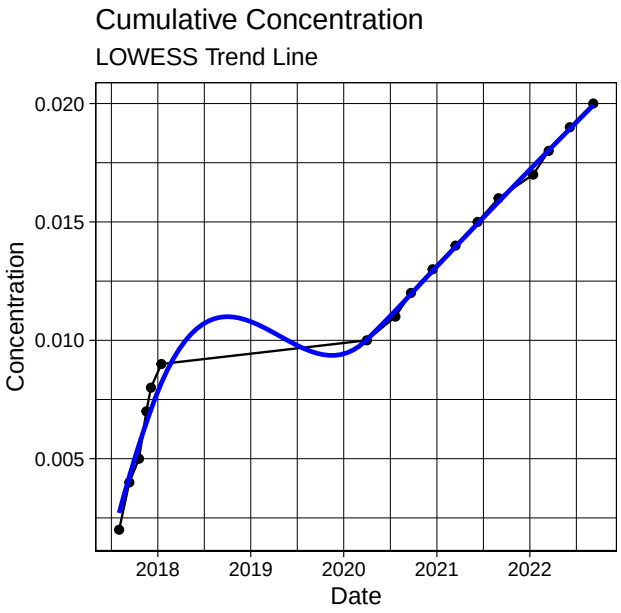




Kendall Trend Test Results Continuous	
n	17
z	-2.46
p	0.01
S	-40
varS	252
tau	-0.53
mean	0
sd	0
cov	0.33
results	DECREASING

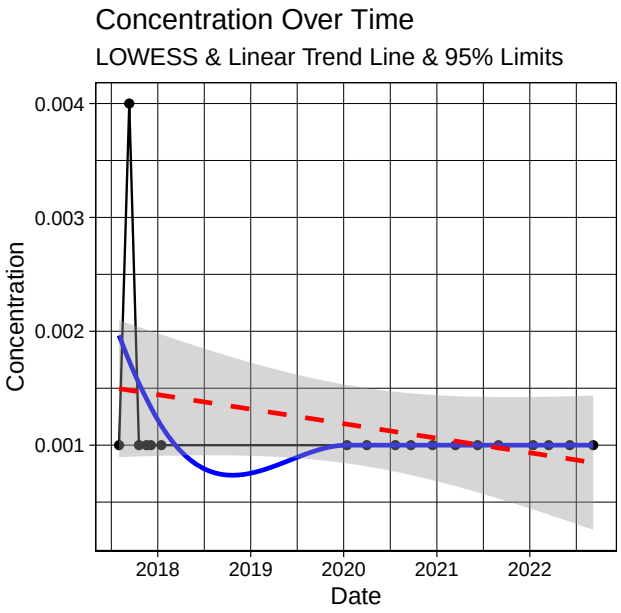
Report for ID : MW227 and Analyte : PFOS

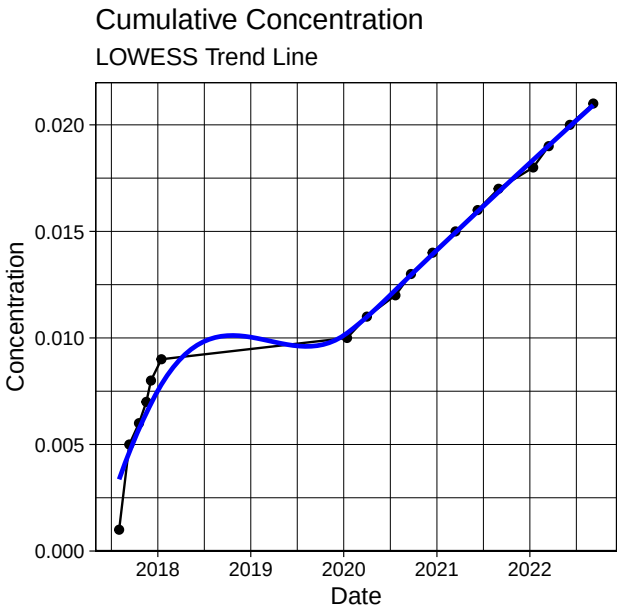




Kendall Trend Test Results Continuous	
n	18
z	-1.35
p	0.18
S	-15
varS	107.67
tau	-0.29
mean	0
sd	0
cov	0.61
results	STABLE

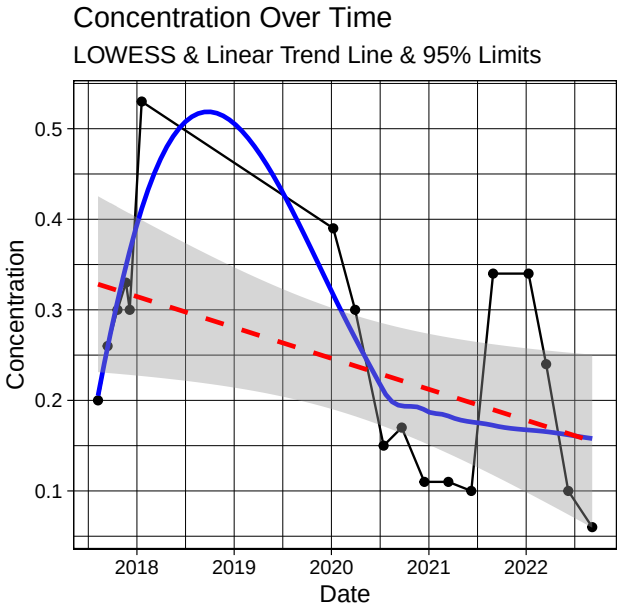
Report for ID : MW228 and Analyte : PFOS

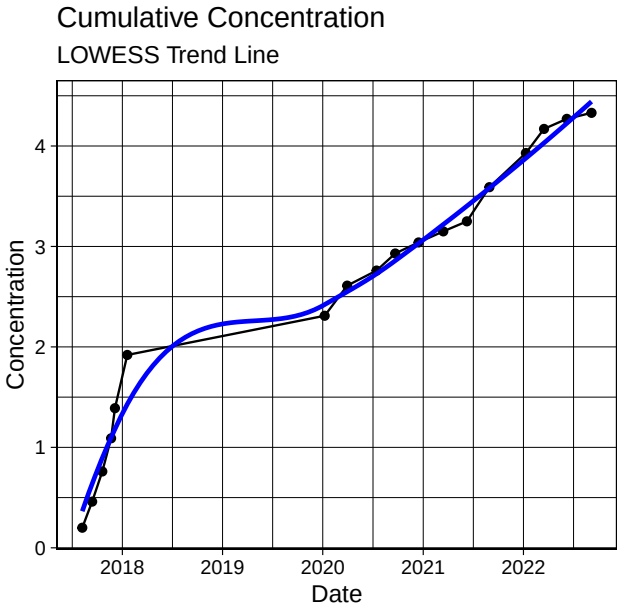




Kendall Trend Test Results Continuous	
n	18
z	-1.83
p	0.07
S	-49
varS	690.33
tau	-0.33
mean	0.24
sd	0.13
cov	0.52
results	POSSIBLY DECREASING

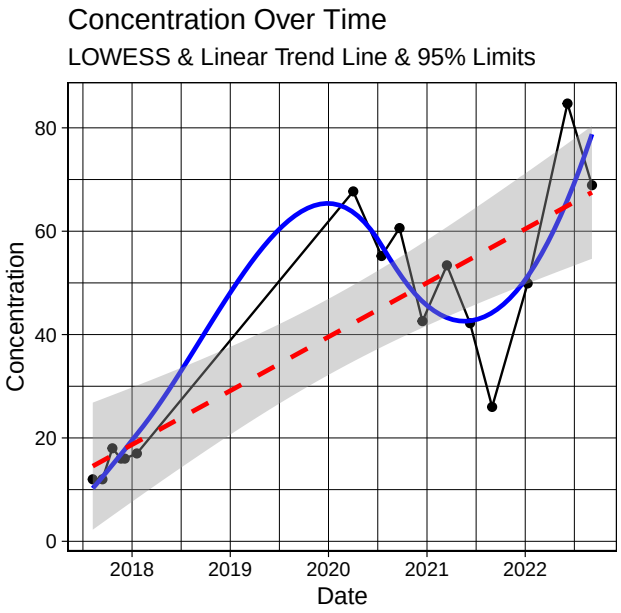
Report for ID : MW233 and Analyte : PFOS

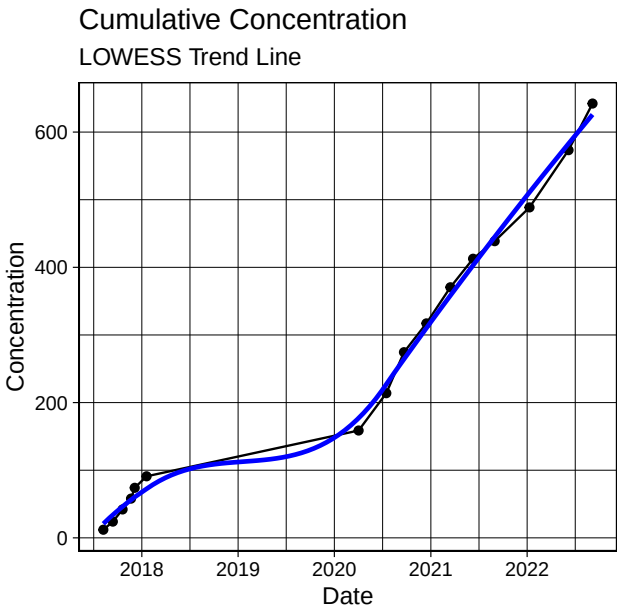




Kendall Trend Test Results Continuous	
n	16
z	2.84
p	0
S	64
varS	491.33
tau	0.54
mean	40.14
sd	23.77
cov	0.59
results	INCREASING

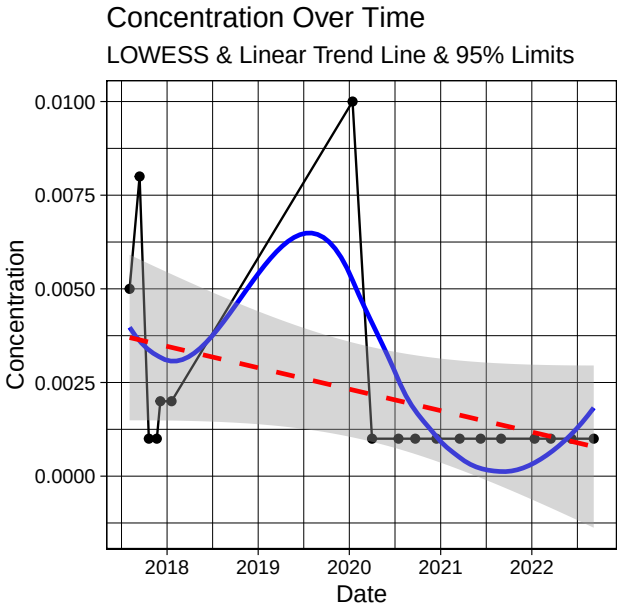
Report for ID : MW236 and Analyte : PFOS

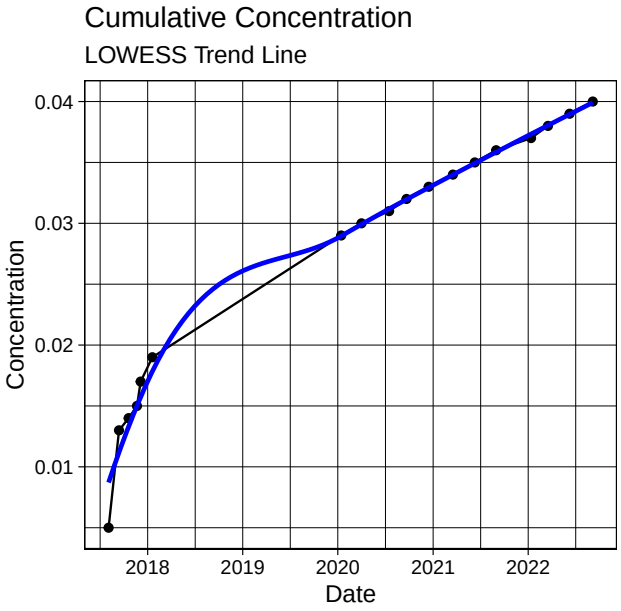




Kendall Trend Test Results Continuous	
n	18
z	-2.47
p	0.01
S	-52
varS	427.33
tau	-0.49
mean	0
sd	0
cov	1.2
results	DECREASING

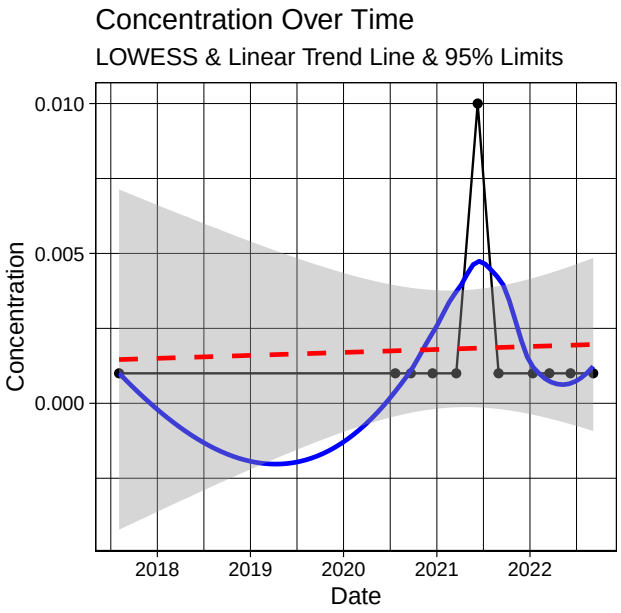
Report for ID : MW238 and Analyte : PFOS

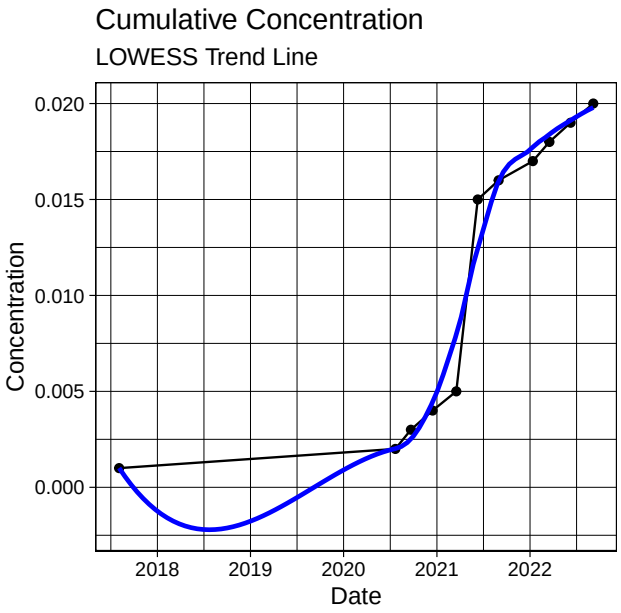




Kendall Trend Test Results Continuous	
n	11
z	0
p	1
S	0
varS	40
tau	0
mean	0
sd	0
cov	1.49
results	NO CLEAR TREND

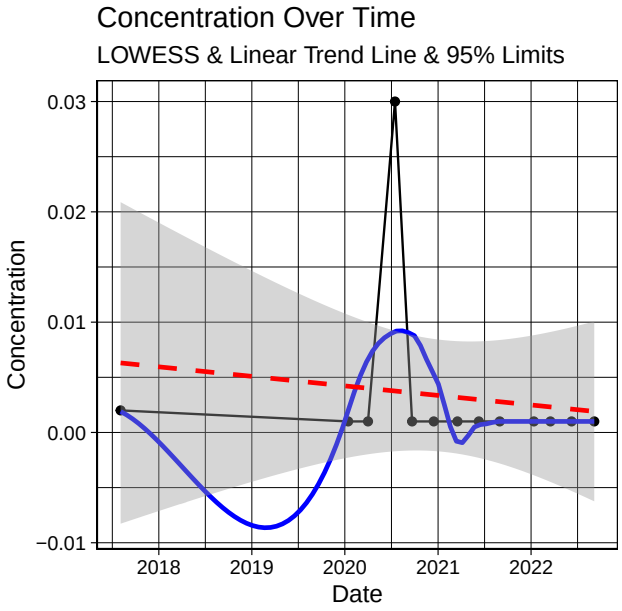
Report for ID : MW239 and Analyte : PFOS

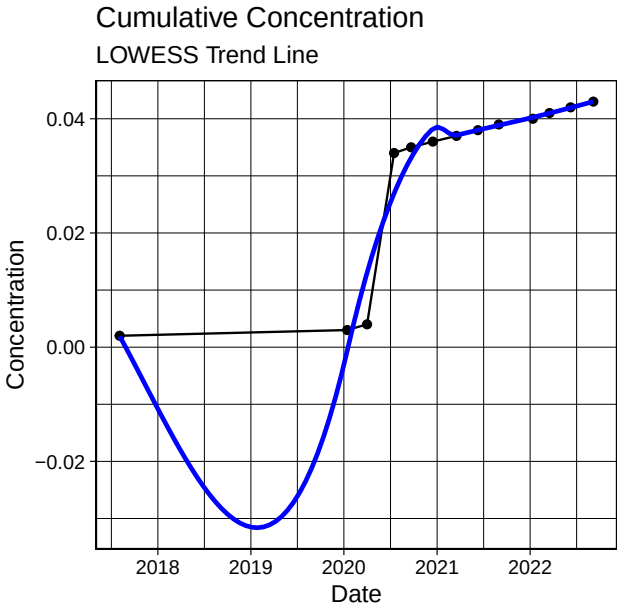




Kendall Trend Test Results Continuous	
n	13
z	-1.57
p	0.12
S	-17
varS	103.67
tau	-0.4
mean	0
sd	0.01
cov	2.43
results	NO CLEAR TREND

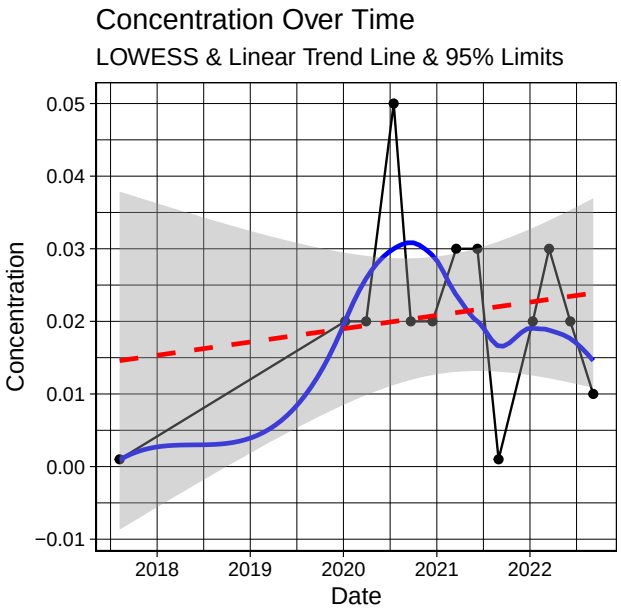
Report for ID : MW240 and Analyte : PFOS

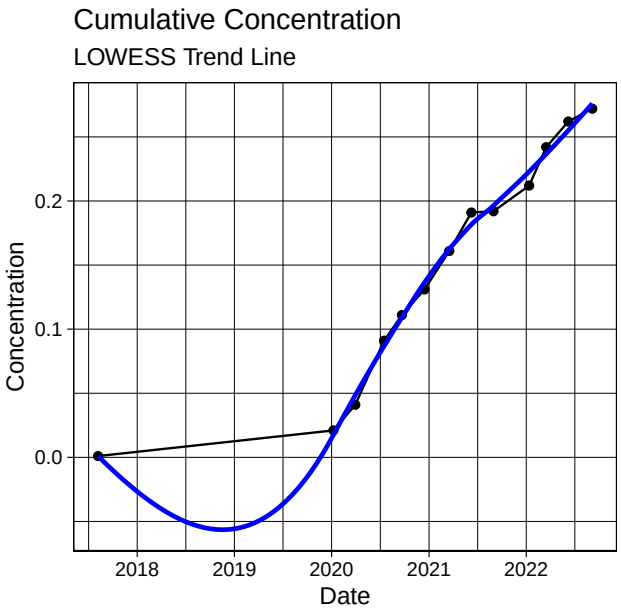




Kendall Trend Test Results Continuous	
n	13
z	0
p	1
S	1
varS	235.67
tau	0.01
mean	0.02
sd	0.01
cov	0.62
results	NO CLEAR TREND

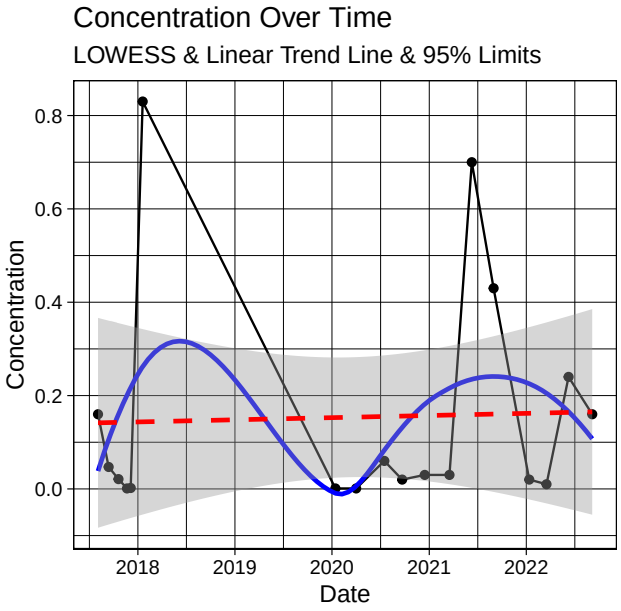
Report for ID : MW242 and Analyte : PFOS

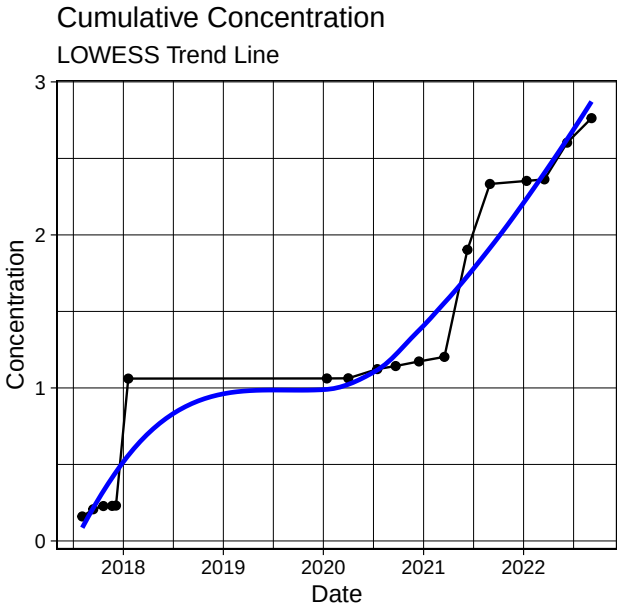




Kendall Trend Test Results Continuous	
n	18
z	0.69
p	0.49
S	19
varS	690.33
tau	0.13
mean	0.15
sd	0.25
cov	1.62
results	NO CLEAR TREND

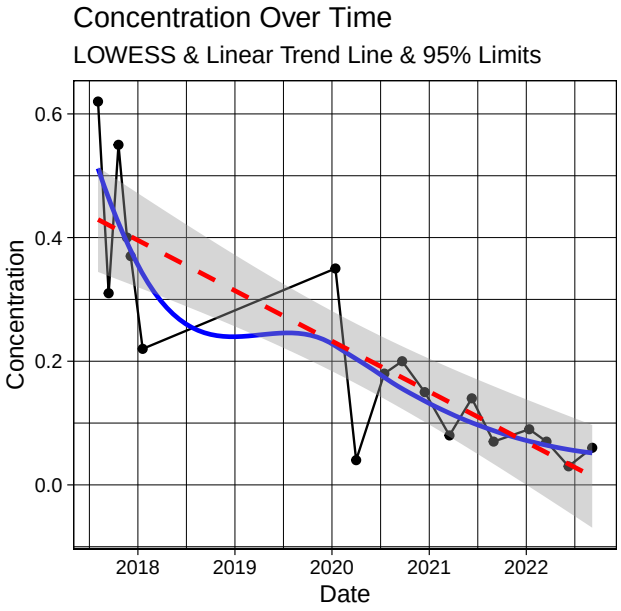
Report for ID : MW243 and Analyte : PFOS

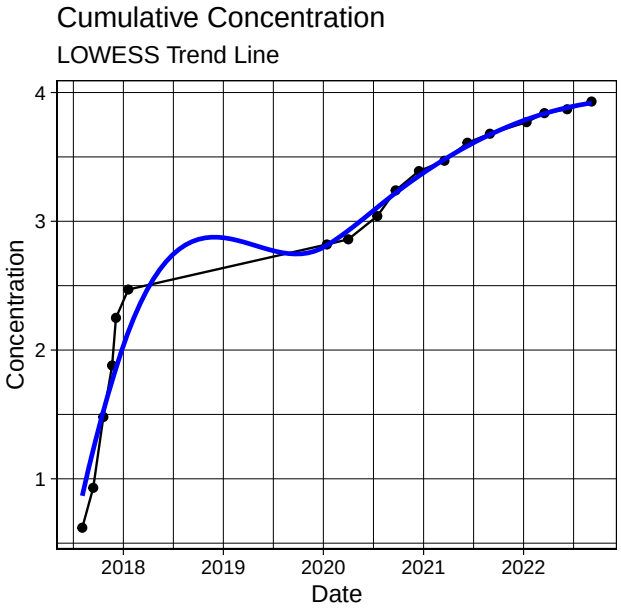




Kendall Trend Test Results Continuous	
n	18
z	-4.28
p	0
S	-114
varS	696
tau	-0.75
mean	0.22
sd	0.18
cov	0.81
results	DECREASING

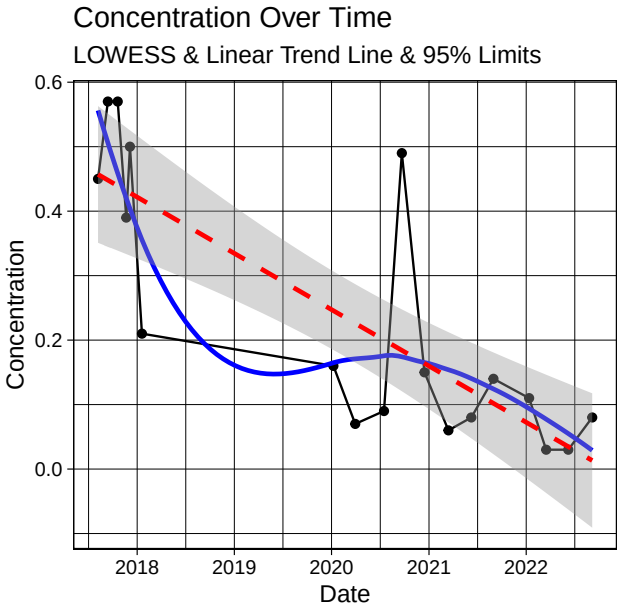
Report for ID : MW245 and Analyte : PFOS

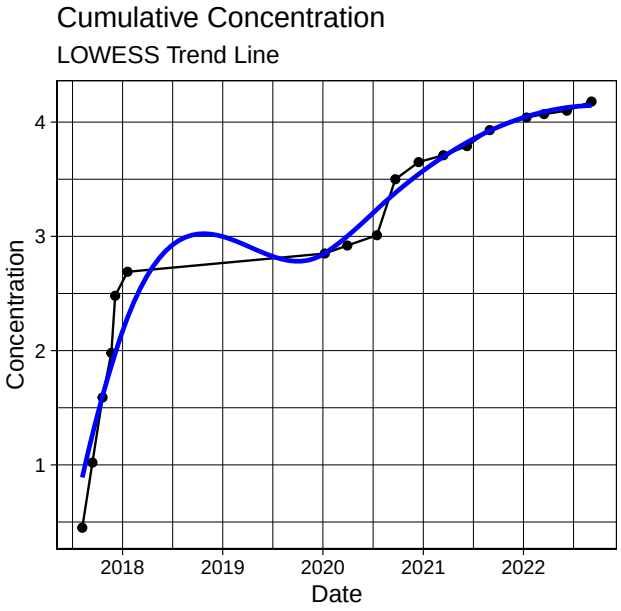




Kendall Trend Test Results Continuous	
n	18
z	-3.61
p	0
S	-96
varS	694
tau	-0.63
mean	0.23
sd	0.2
cov	0.86
results	DECREASING

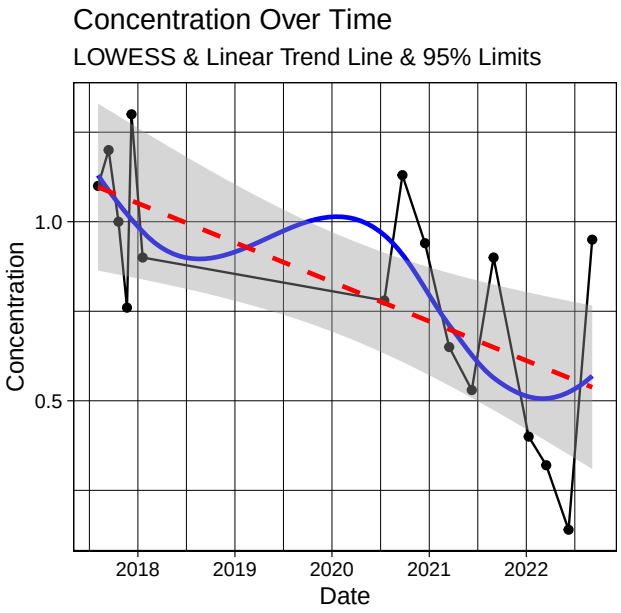
Report for ID : MW249 and Analyte : PFOS

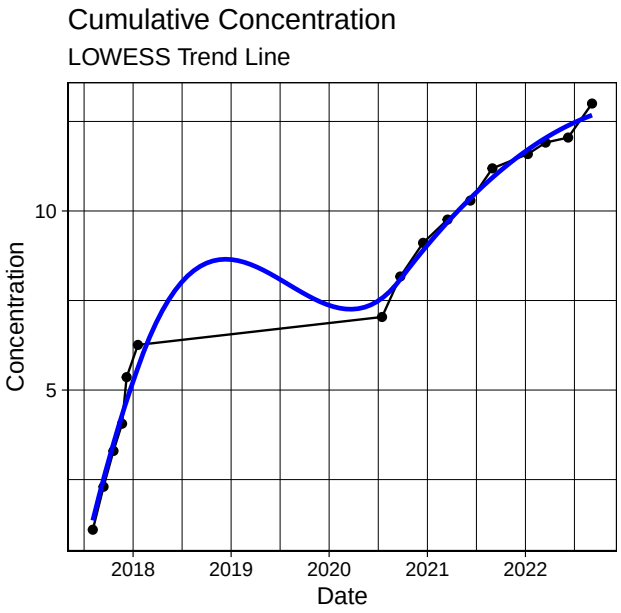




Kendall Trend Test Results Continuous	
n	16
z	-2.7
p	0.01
S	-61
varS	492.33
tau	-0.51
mean	0.81
sd	0.33
cov	0.41
results	DECREASING

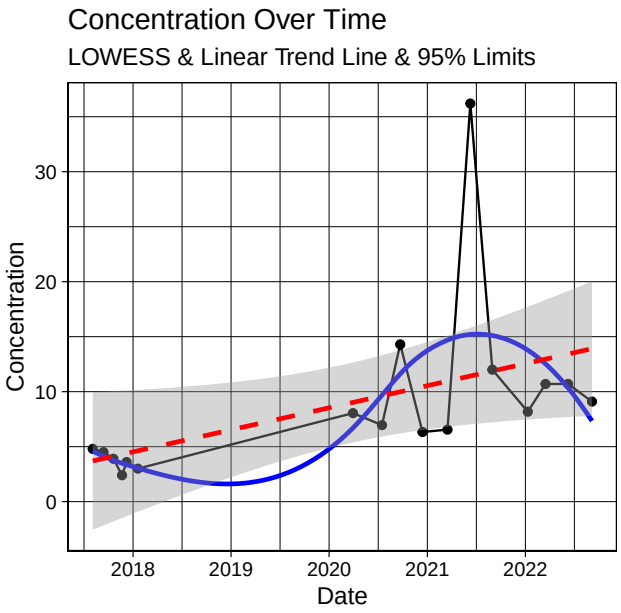
Report for ID : MW255 and Analyte : PFOS

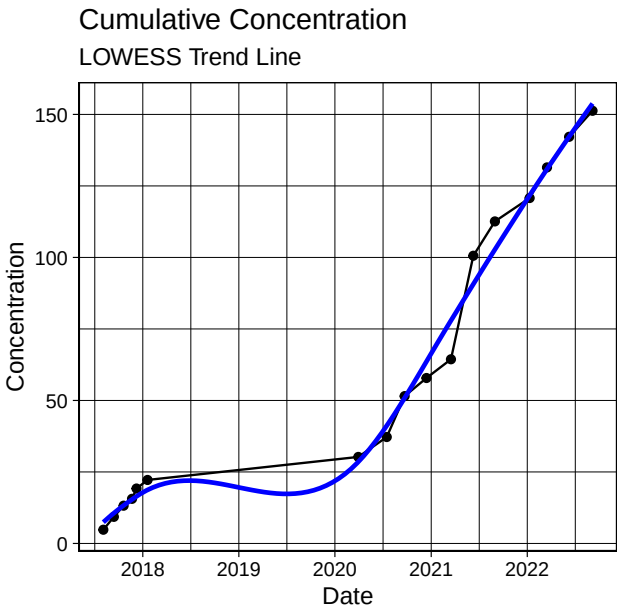




Kendall Trend Test Results Continuous	
n	17
z	2.56
p	0.01
S	63
varS	588.33
tau	0.46
mean	8.9
sd	7.8
cov	0.88
results	INCREASING

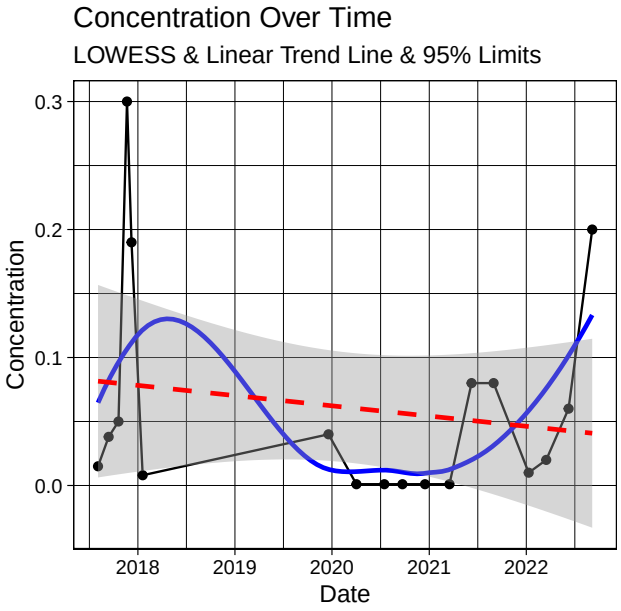
Report for ID : MW256 and Analyte : PFOS

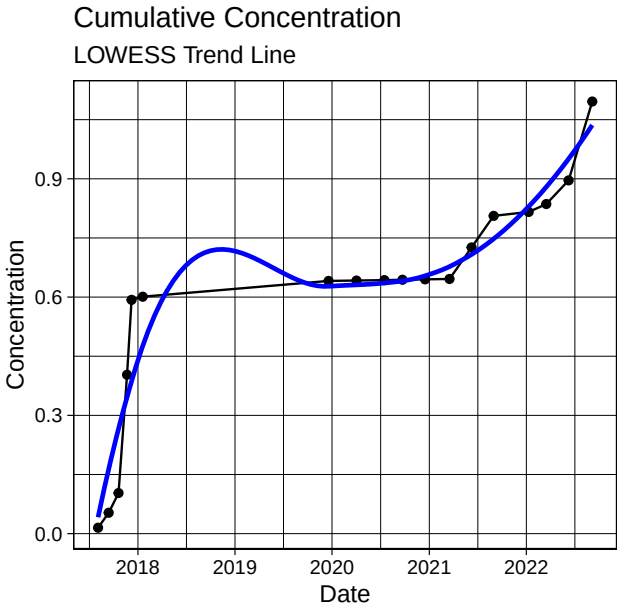




Kendall Trend Test Results Continuous	
n	18
z	0.19
p	0.85
S	6
varS	679.33
tau	0.04
mean	0.06
sd	0.08
cov	1.39
results	NO CLEAR TREND

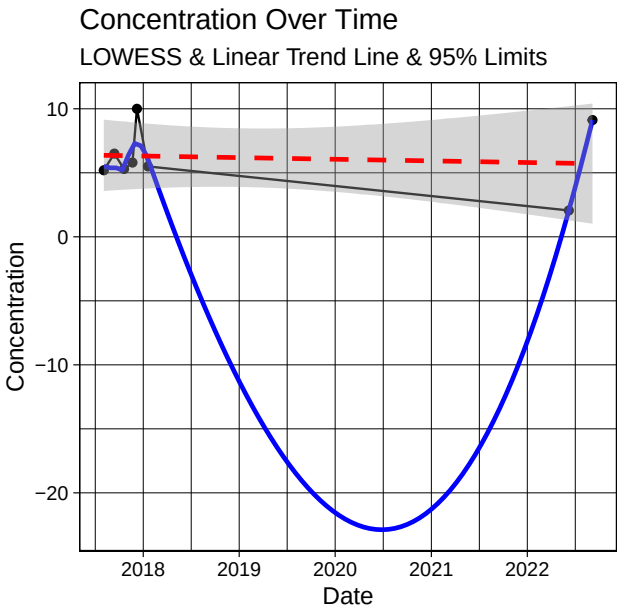
Report for ID : MW257 and Analyte : PFOS

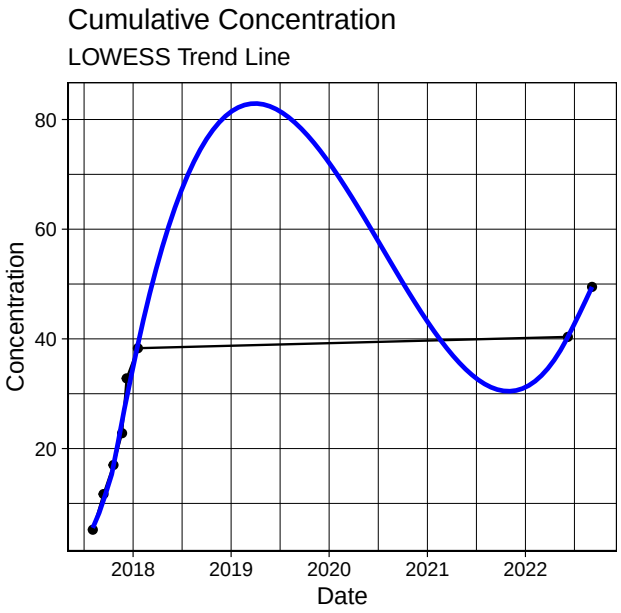




Kendall Trend Test Results Continuous	
n	8
z	0.37
p	0.71
S	4
varS	65.33
tau	0.14
mean	6.18
sd	2.47
cov	0.4
results	NO CLEAR TREND

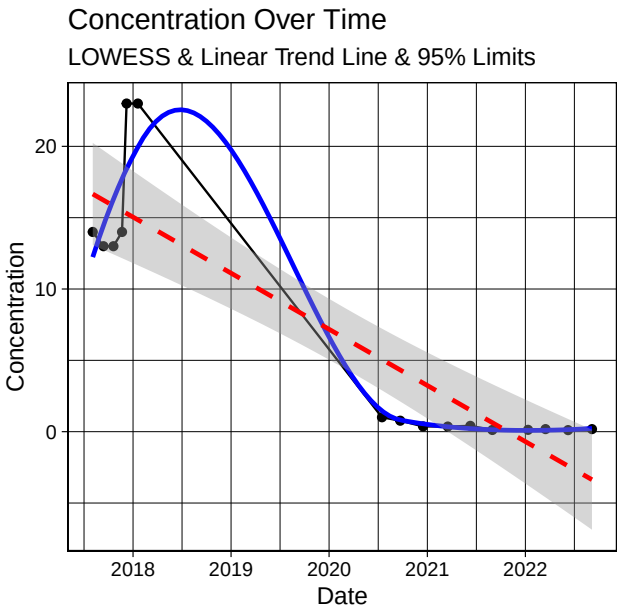
Report for ID : MW258 and Analyte : PFOS

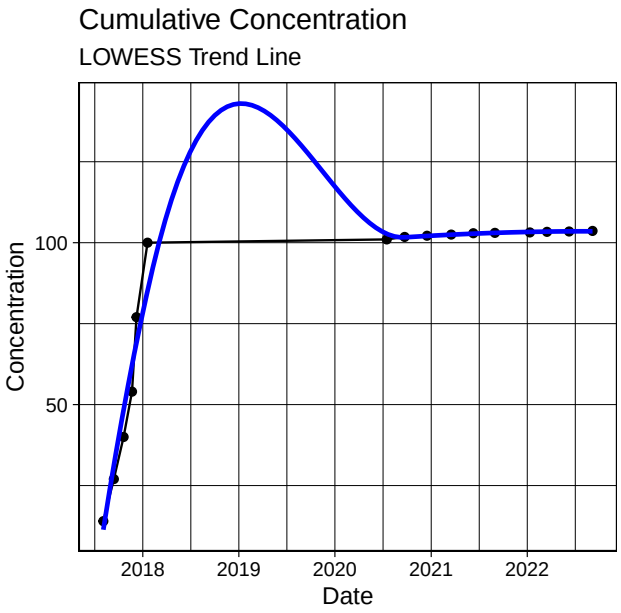




Kendall Trend Test Results Continuous	
n	16
z	-3.57
p	0
S	-80
varS	489.33
tau	-0.68
mean	6.48
sd	8.64
cov	1.33
results	DECREASING

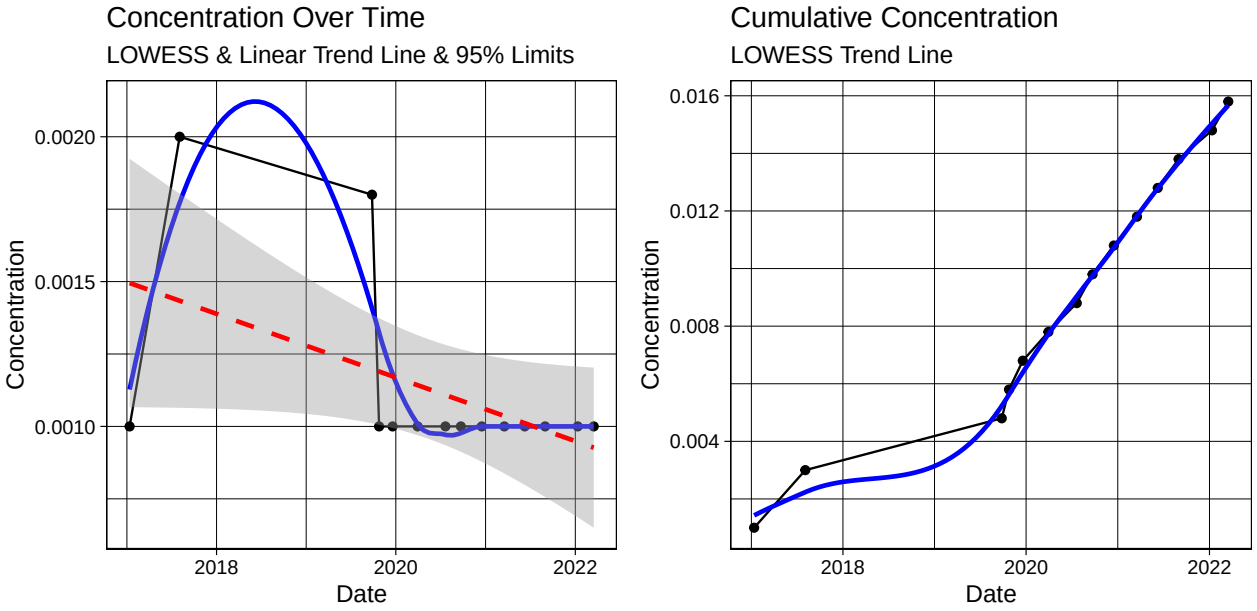
Report for ID : MW259 and Analyte : PFOS





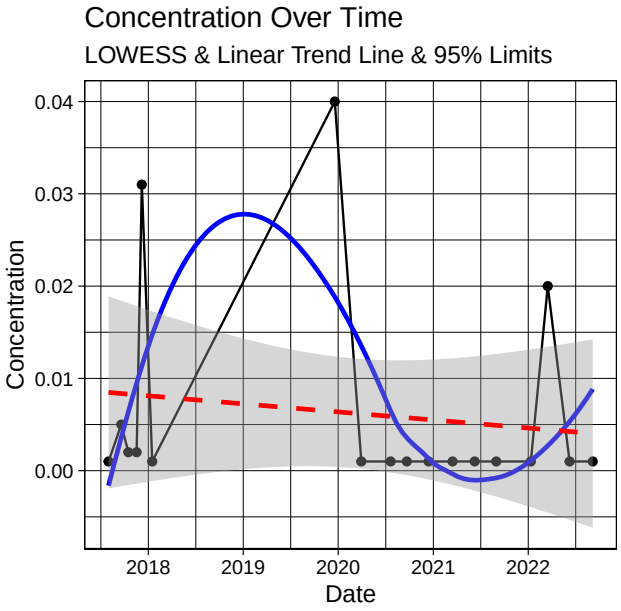
Kendall Trend Test Results Continuous	
n	14
z	-1.82
p	0.07
S	-21
varS	121
tau	-0.44
mean	0
sd	0
cov	0.29
results	POSSIBLY DECREASING

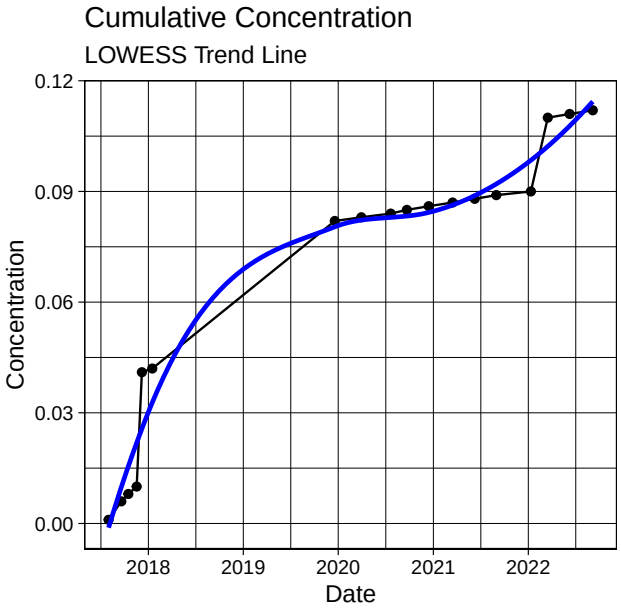
Report for ID : MW261 and Analyte : PFOS



Kendall Trend Test Results Continuous	
n	18
z	-1.5
p	0.13
S	-34
varS	483.33
tau	-0.3
mean	0.01
sd	0.01
cov	1.87
results	NO CLEAR TREND

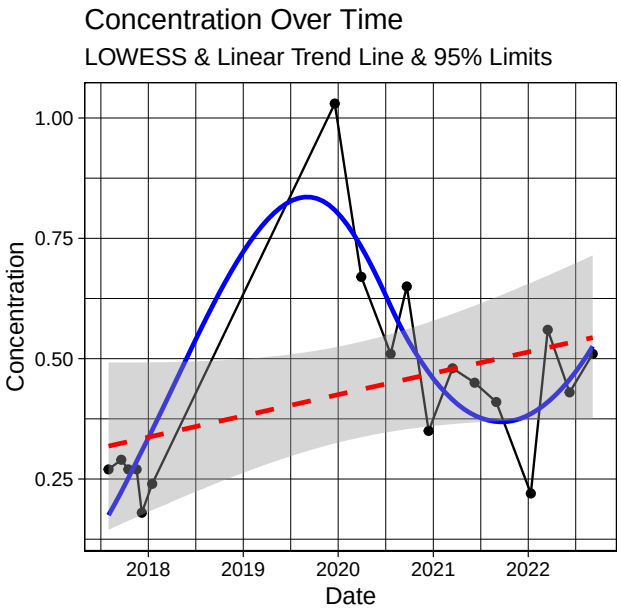
Report for ID : MW268 and Analyte : PFOS

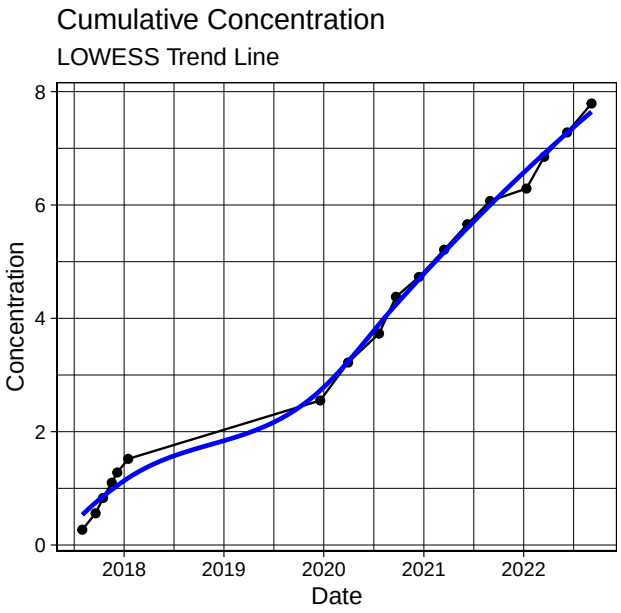




Kendall Trend Test Results Continuous	
n	18
z	0.99
p	0.32
S	27
varS	692.33
tau	0.18
mean	0.43
sd	0.21
cov	0.48
results	NO CLEAR TREND

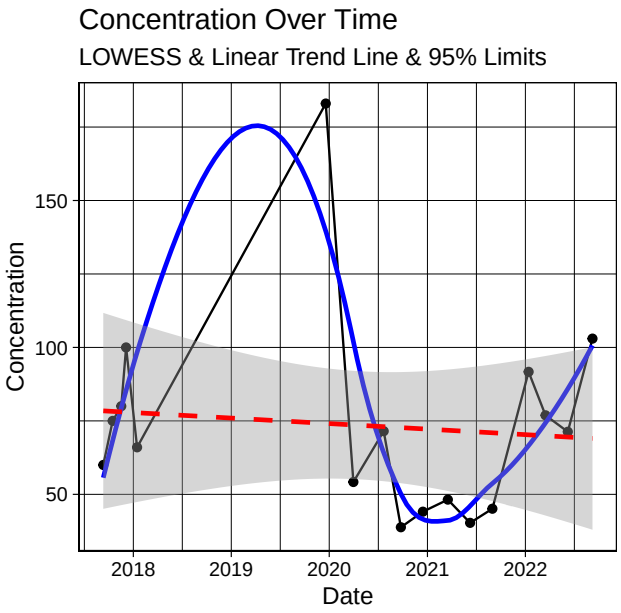
Report for ID : MW269 and Analyte : PFOS

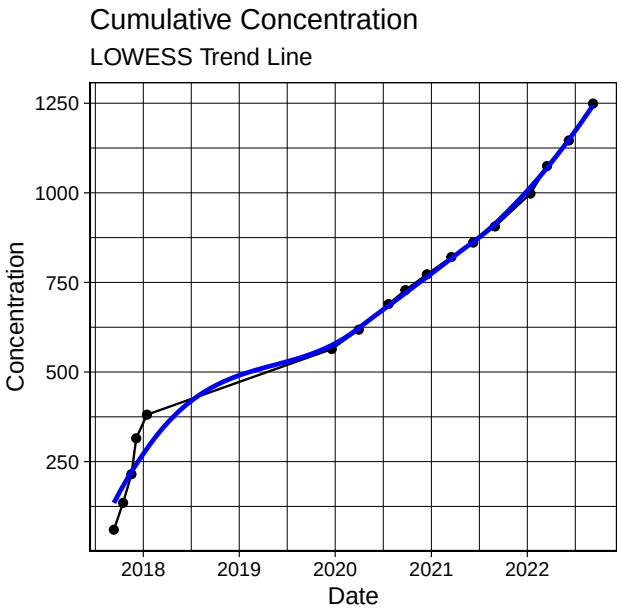




Kendall Trend Test Results Continuous	
n	17
z	-0.12
p	0.9
S	-4
varS	589.33
tau	-0.03
mean	73.48
sd	34.63
cov	0.47
results	STABLE

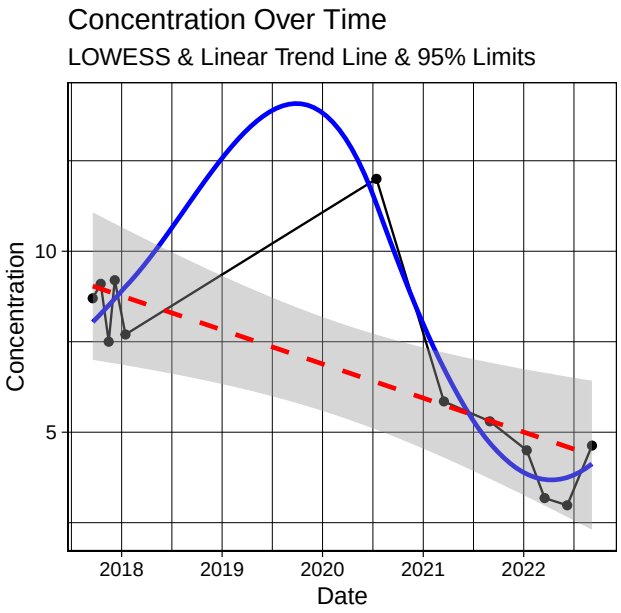
Report for ID : MW282 and Analyte : PFOS

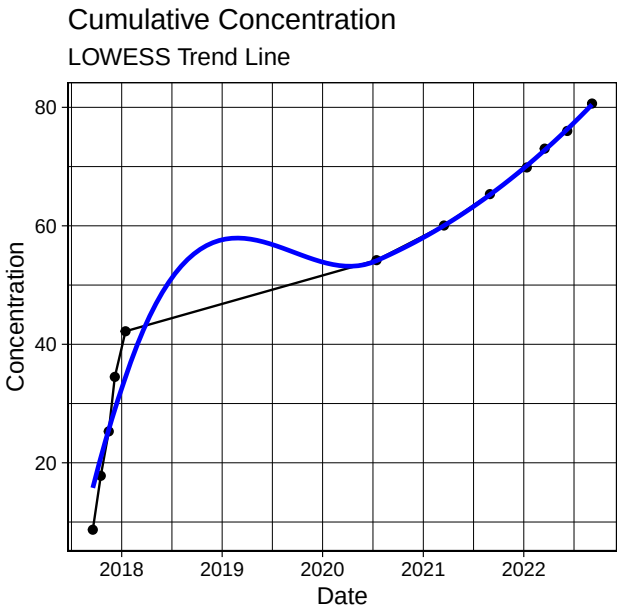




Kendall Trend Test Results Continuous	
n	12
z	-2.67
p	0.01
S	-40
varS	212.67
tau	-0.61
mean	6.72
sd	2.76
cov	0.41
results	DECREASING

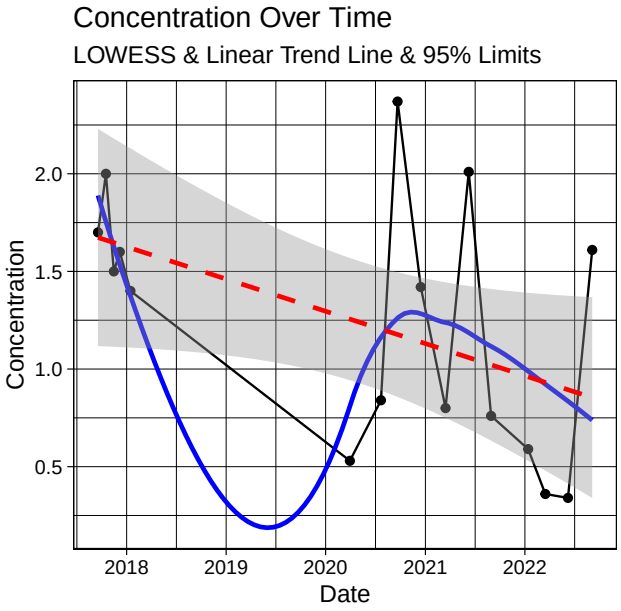
Report for ID : MW288 and Analyte : PFOS

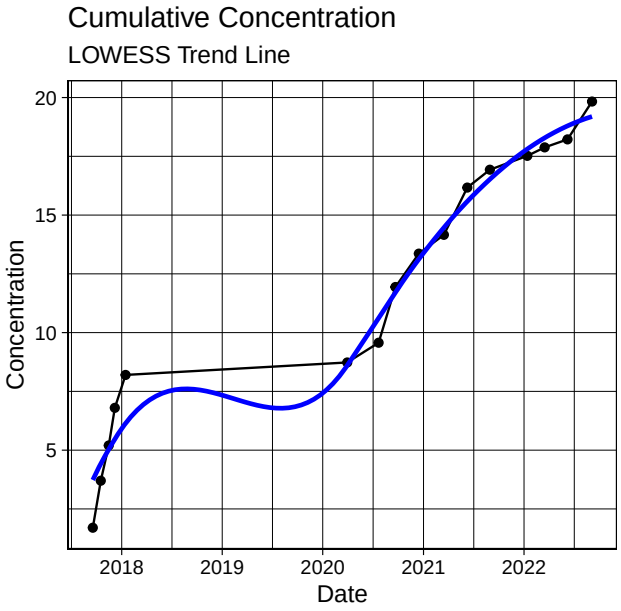




Kendall Trend Test Results Continuous	
n	16
z	-2.12
p	0.03
S	-48
varS	493.33
tau	-0.4
mean	1.24
sd	0.64
cov	0.52
results	DECREASING

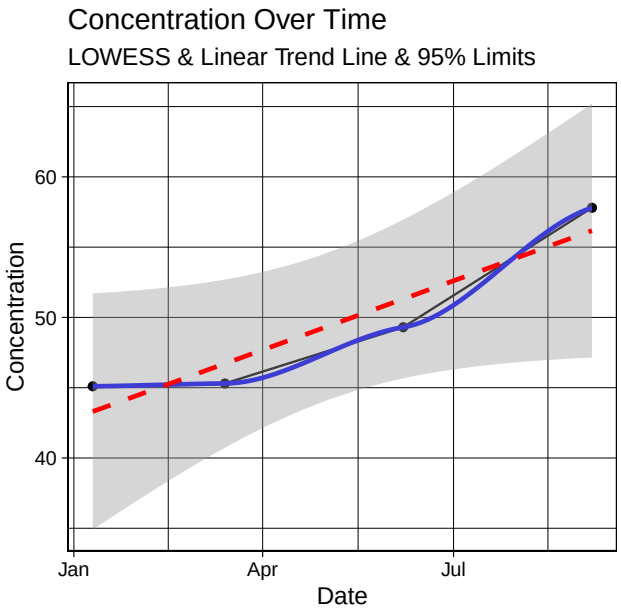
Report for ID : MW289 and Analyte : PFOS

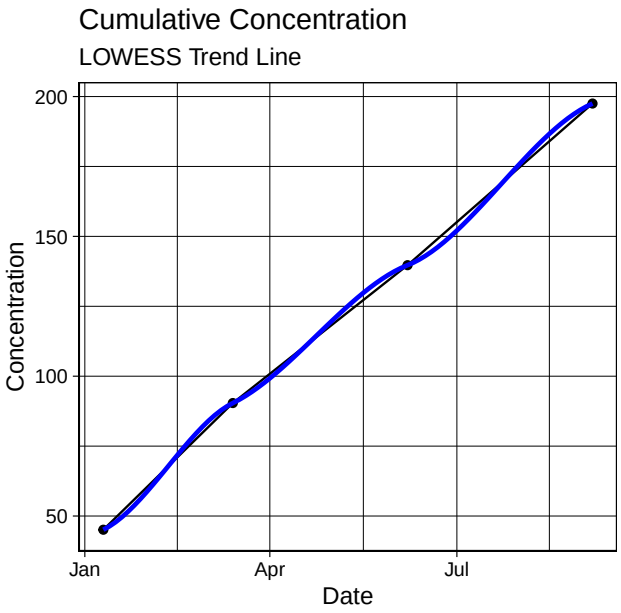




Kendall Trend Test Results Continuous	
n	4
z	1.7
p	0.09
S	6
varS	8.67
tau	1
mean	49.38
sd	5.94
cov	0.12
results	POSSIBLY INCREASING

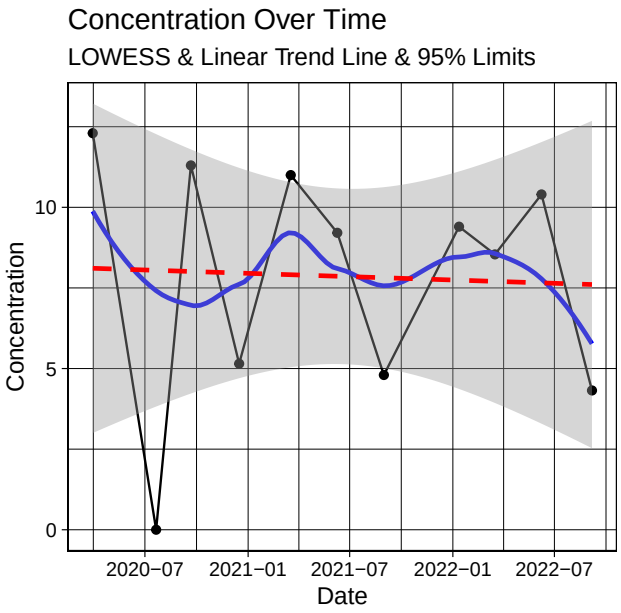
Report for ID : MW500 and Analyte : PFOS

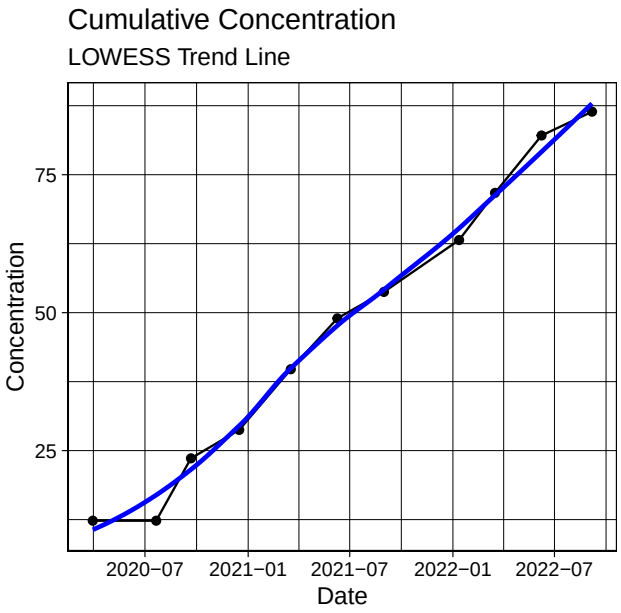




Kendall Trend Test Results Continuous	
n	11
z	-0.93
p	0.35
S	-13
varS	165
tau	-0.24
mean	7.86
sd	3.79
cov	0.48
results	STABLE

Report for ID : MW516 and Analyte : PFOS





Trend Report

Report Date & Time: 2023-03-02 00:53:26

Data File Name: inputSum2022.csv

Report Title: Sum of PFOS and PFHxS Trend in Groundwater

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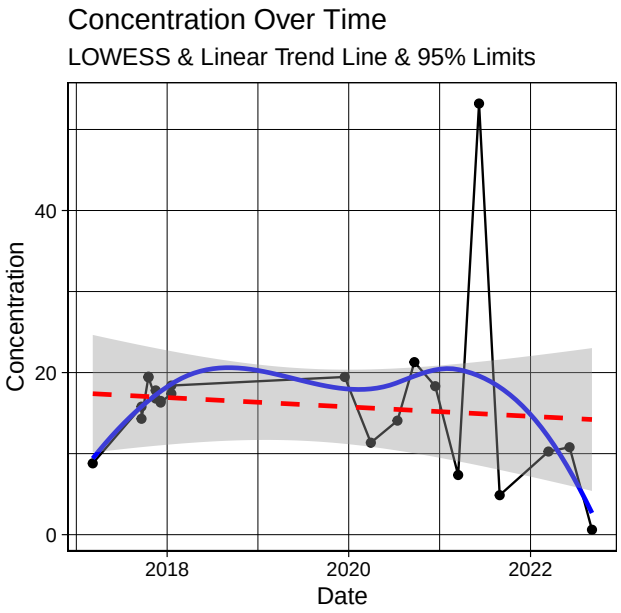
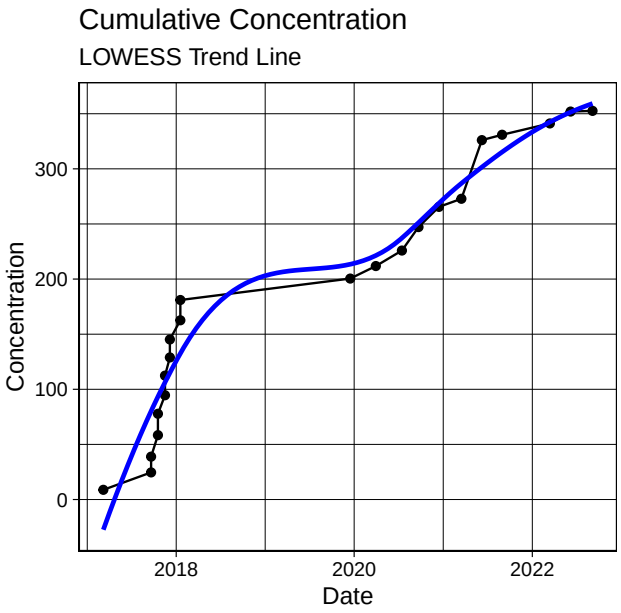
Kendall Trend Test Results Continuous	
n	22
z	-1.07
p	0.28
S	-39
varS	1257.67
tau	-0.17
mean	16.03
sd	9.86
cov	0.62
results	STABLE

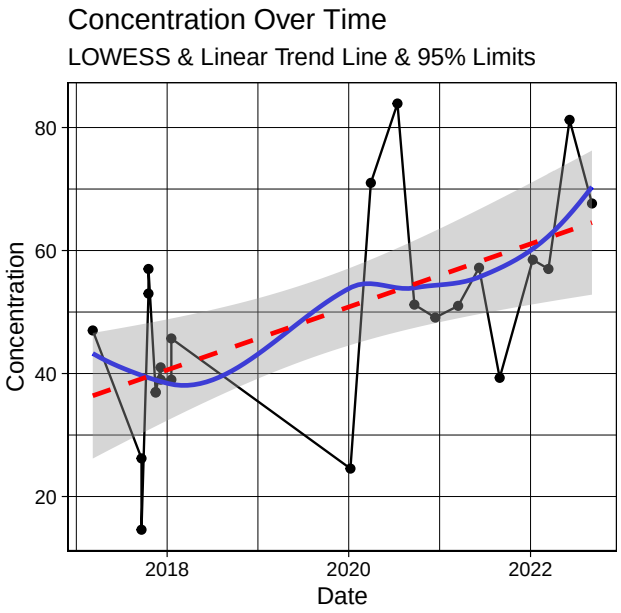
Report for ID : MW109 and Analyte : PFHxSandPFOS

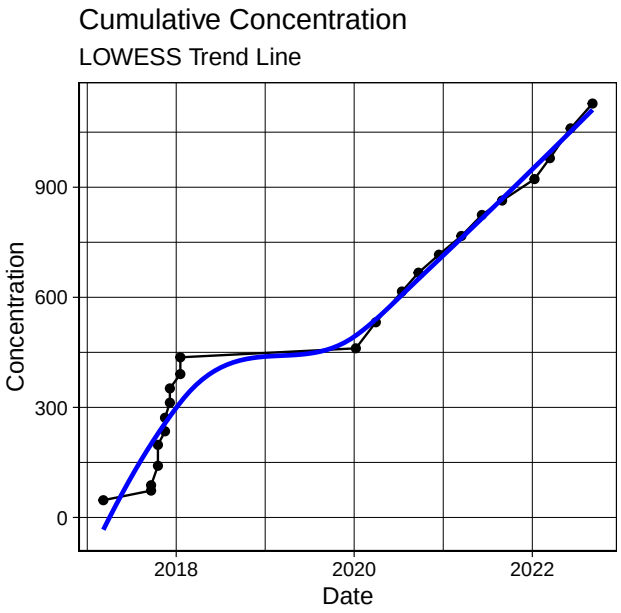




Kendall Trend Test Results Continuous	
n	23
z	2.85
p	0
S	109
varS	1431.67
tau	0.43
mean	49.04
sd	17.01
cov	0.35
results	INCREASING

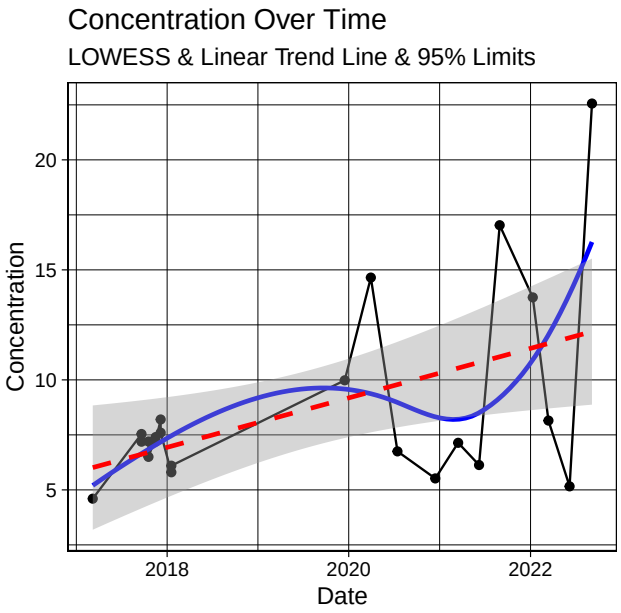
Report for ID : MW112 and Analyte : PFHxSandPFOS

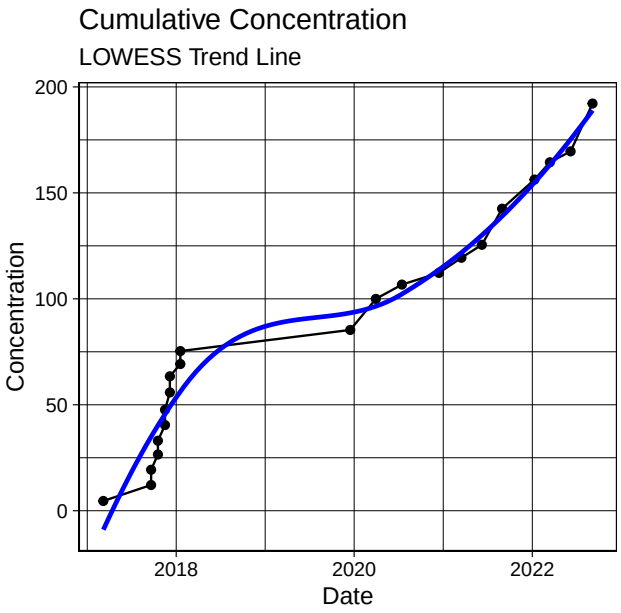




Kendall Trend Test Results Continuous	
n	22
z	1.16
p	0.25
S	42
varS	1256.67
tau	0.18
mean	8.73
sd	4.41
cov	0.5
results	NO CLEAR TREND

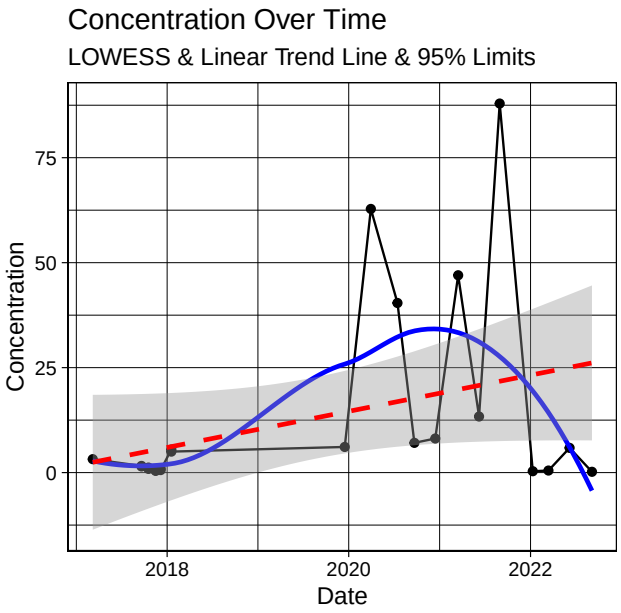
Report for ID : MW120 and Analyte : PFHxSandPFOS

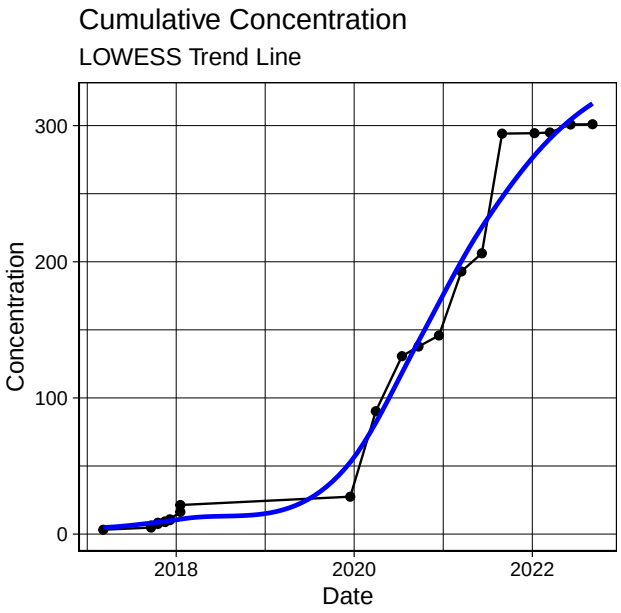




Kendall Trend Test Results Continuous	
n	23
z	0.95
p	0.34
S	37
varS	1433.67
tau	0.15
mean	13.09
sd	23.37
cov	1.79
results	NO CLEAR TREND

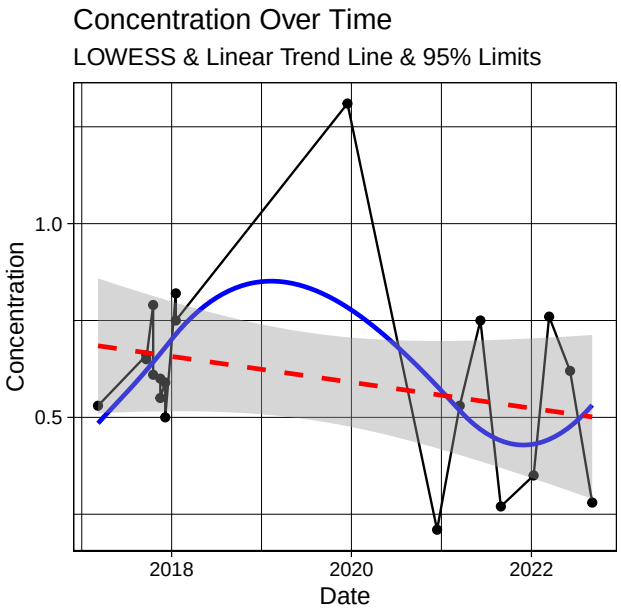
Report for ID : MW121 and Analyte : PFHxSandPFOS

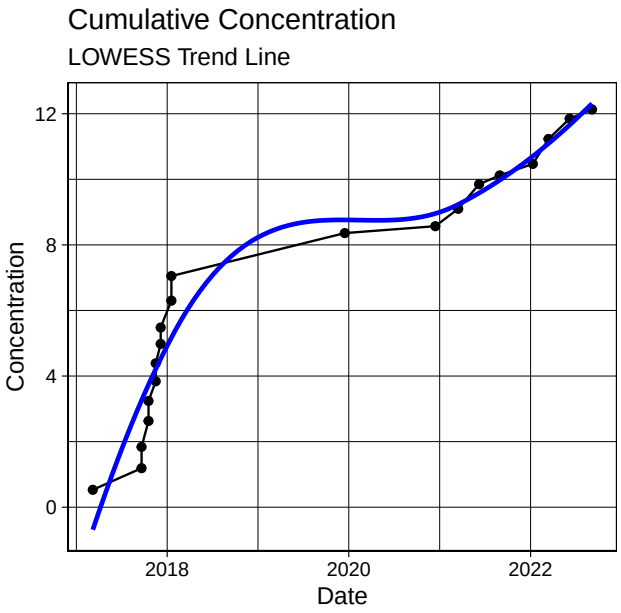




Kendall Trend Test Results Continuous	
n	20
z	-0.94
p	0.35
S	-30
varS	948
tau	-0.16
mean	0.61
sd	0.24
cov	0.4
results	STABLE

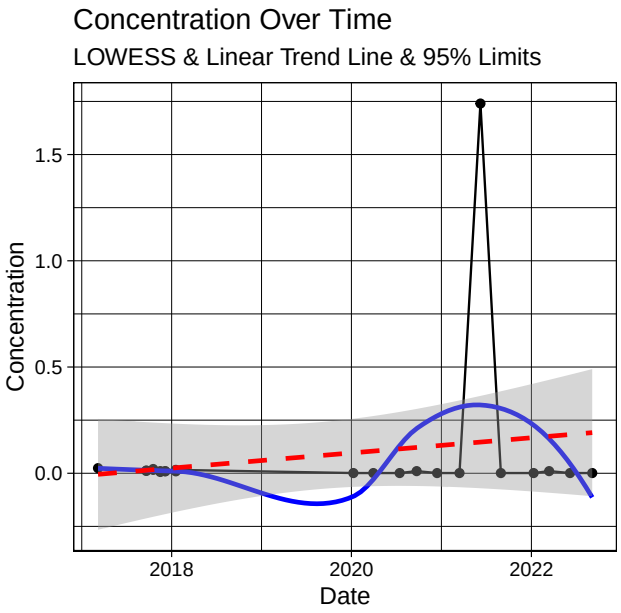
Report for ID : MW123 and Analyte : PFHxSandPFOS

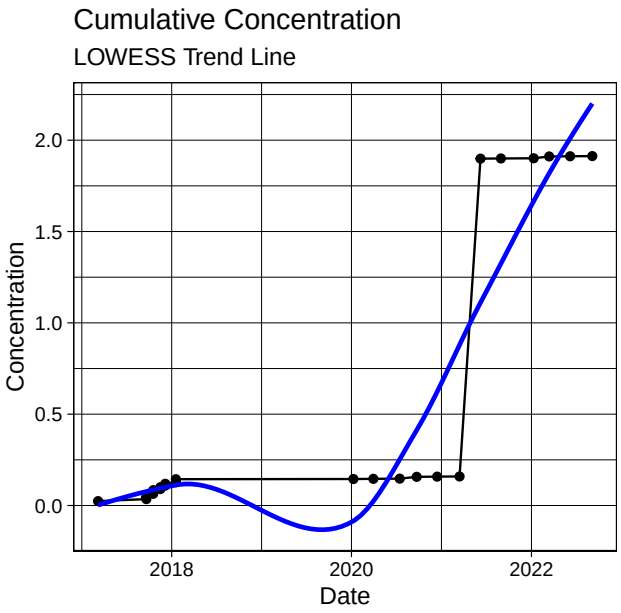




Kendall Trend Test Results Continuous	
n	23
z	-2.91
p	0
S	-107
varS	1331
tau	-0.47
mean	0.08
sd	0.36
cov	4.34
results	DECREASING

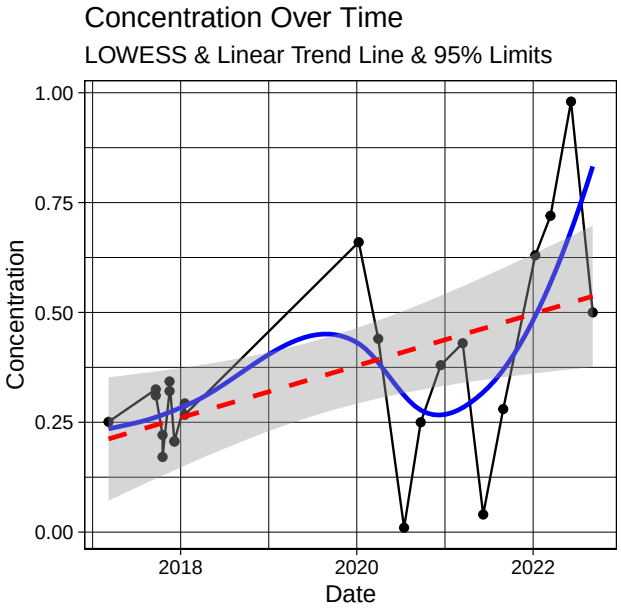
Report for ID : MW124 and Analyte : PFHxSandPFOS

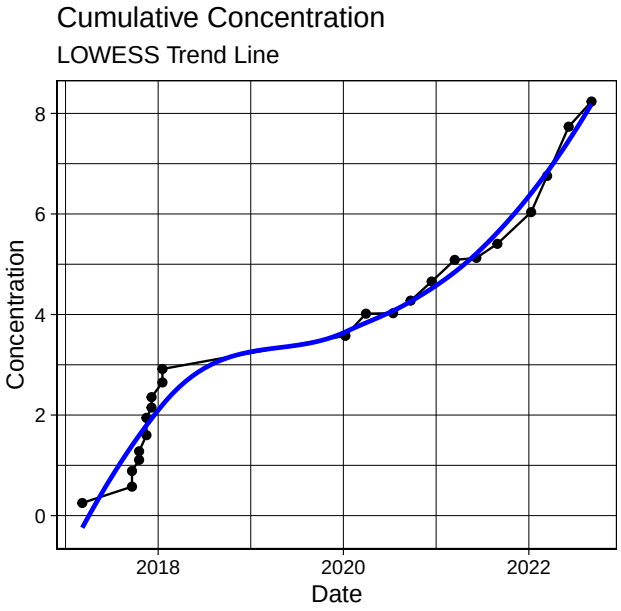




Kendall Trend Test Results Continuous	
n	23
z	2.06
p	0.04
S	79
varS	1433.67
tau	0.31
mean	0.36
sd	0.22
cov	0.62
results	INCREASING

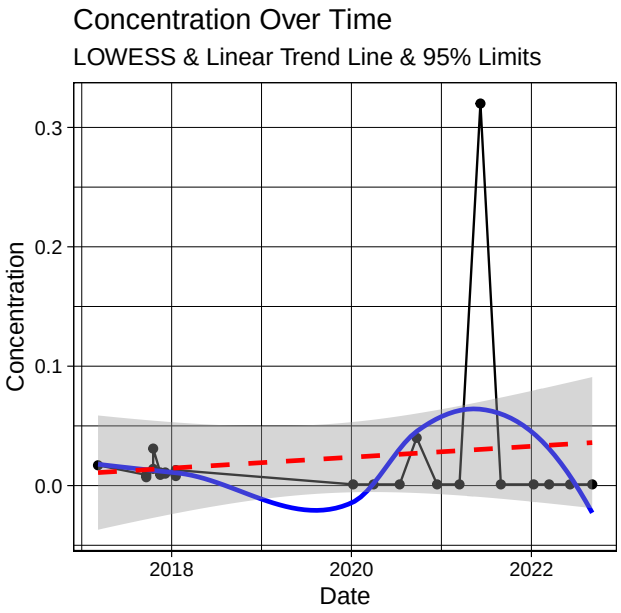
Report for ID : MW125 and Analyte : PFHxSandPFOS

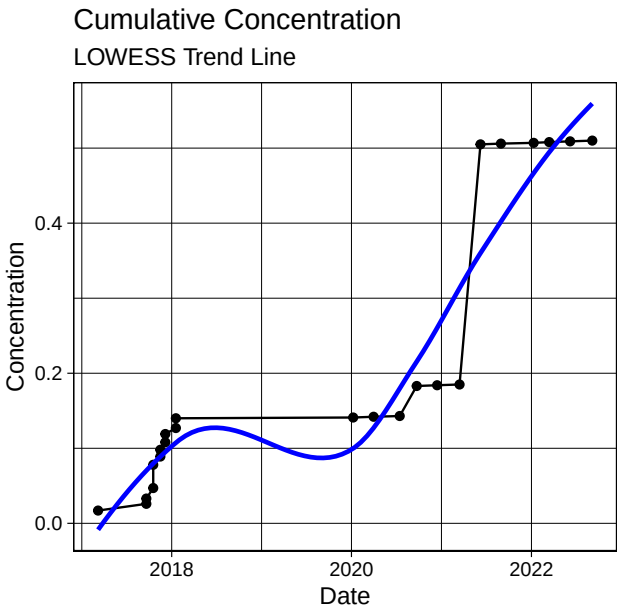




Kendall Trend Test Results Continuous	
n	23
z	-2.63
p	0.01
S	-96
varS	1306.67
tau	-0.42
mean	0.02
sd	0.07
cov	2.96
results	DECREASING

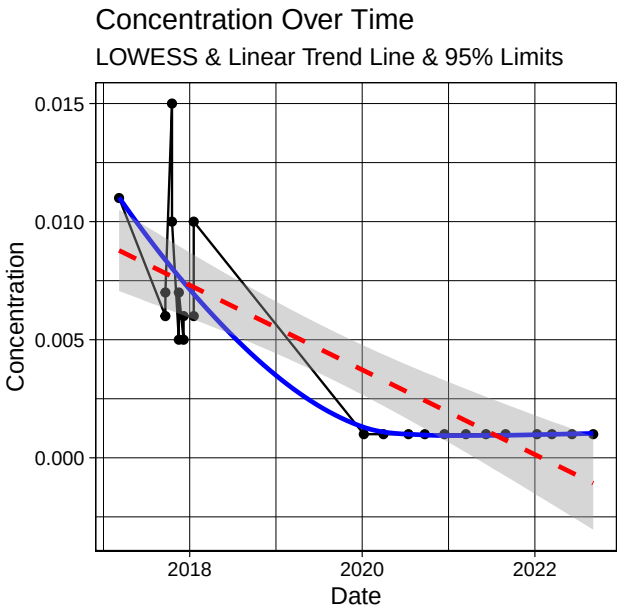
Report for ID : MW126 and Analyte : PFHxSandPFOS

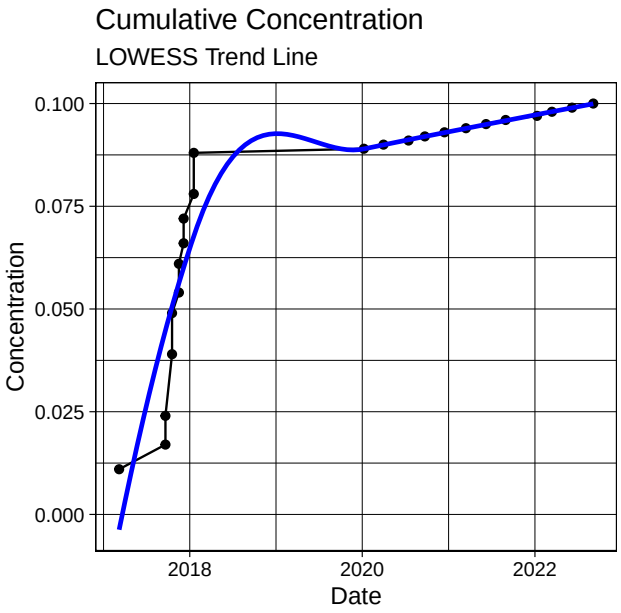




Kendall Trend Test Results Continuous	
n	23
z	-4.07
p	0
S	-143
varS	1214.33
tau	-0.67
mean	0
sd	0
cov	0.95
results	DECREASING

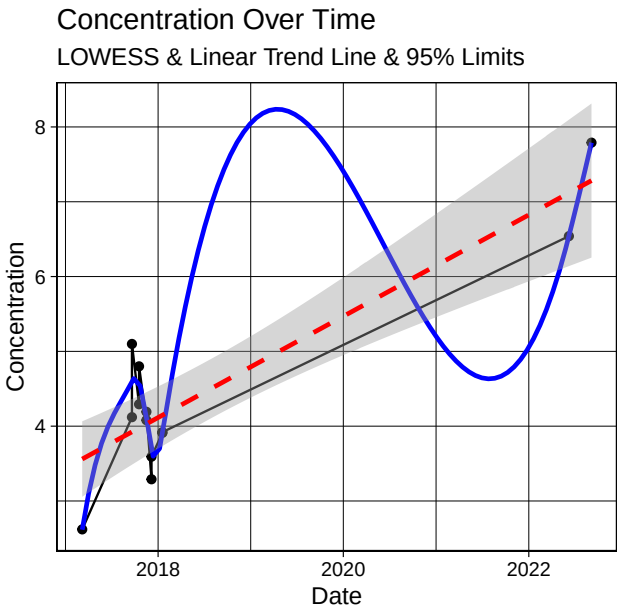
Report for ID : MW127 and Analyte : PFHxSandPFOS

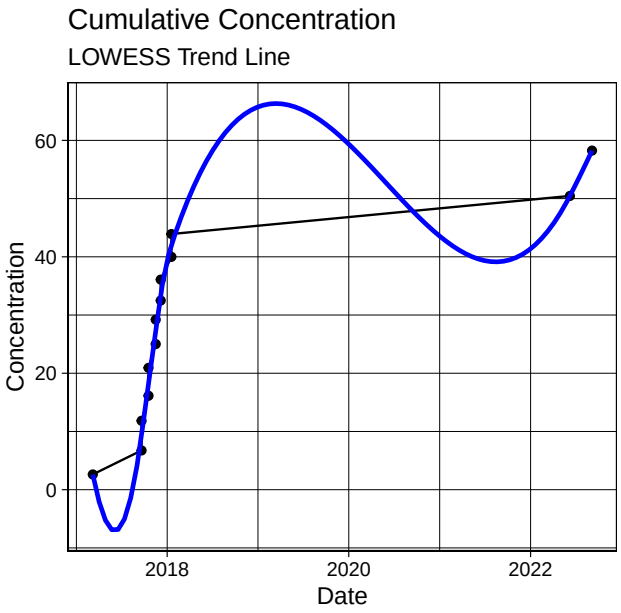




Kendall Trend Test Results Continuous	
n	13
z	0.67
p	0.5
S	12
varS	268.67
tau	0.15
mean	4.48
sd	1.37
cov	0.3
results	NO CLEAR TREND

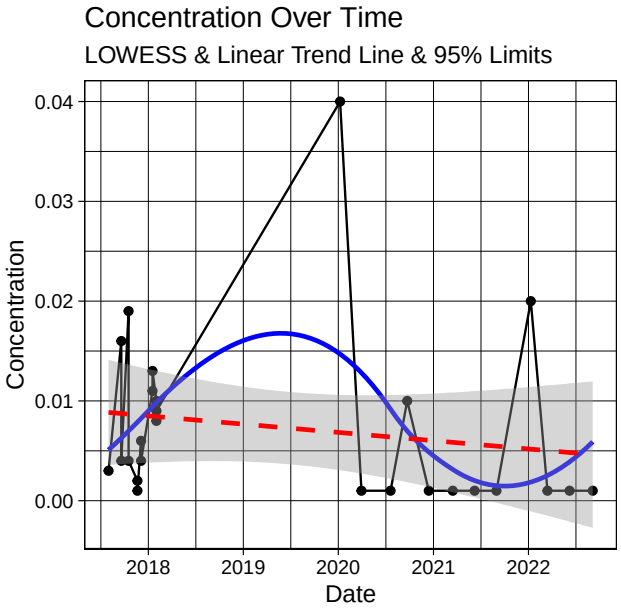
Report for ID : MW128 and Analyte : PFHxSandPFOS

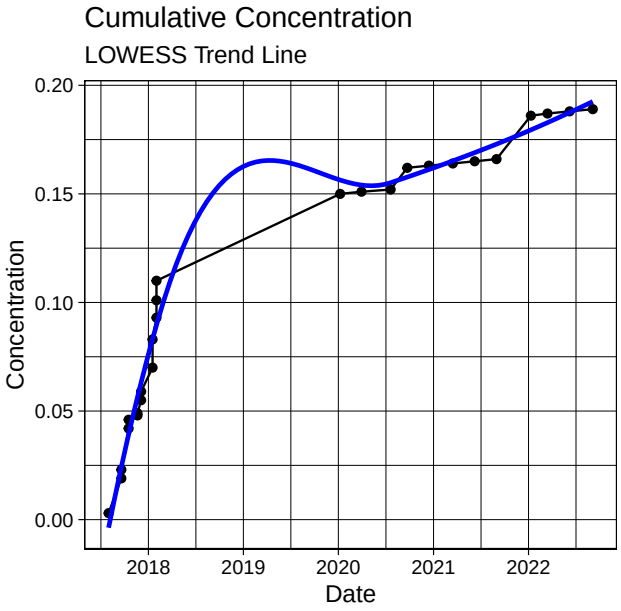




Kendall Trend Test Results Continuous	
n	26
z	-1.84
p	0.07
S	-82
varS	1928.67
tau	-0.27
mean	0.01
sd	0.01
cov	1.23
results	POSSIBLY DECREASING

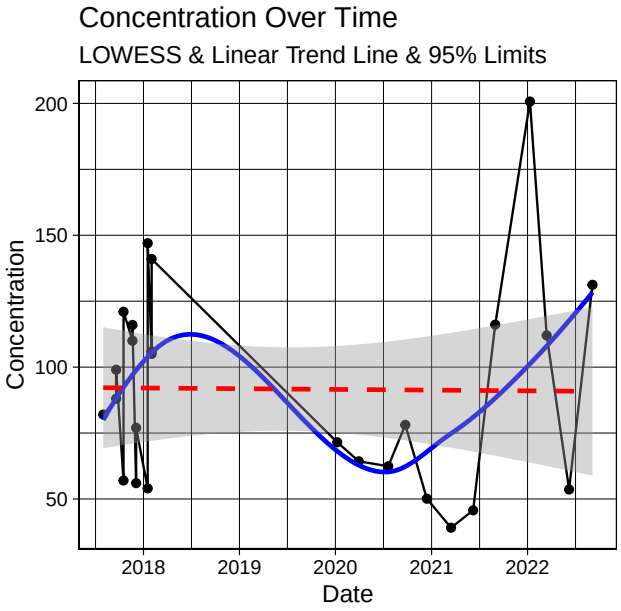
Report for ID : MW139 and Analyte : PFHxSandPFOS

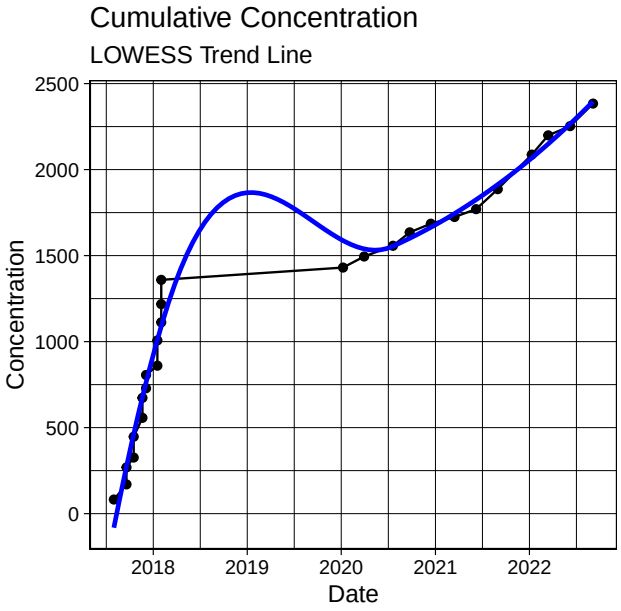




Kendall Trend Test Results Continuous	
n	26
z	-0.35
p	0.72
S	-17
varS	2058.33
tau	-0.05
mean	91.68
sd	38.29
cov	0.42
results	STABLE

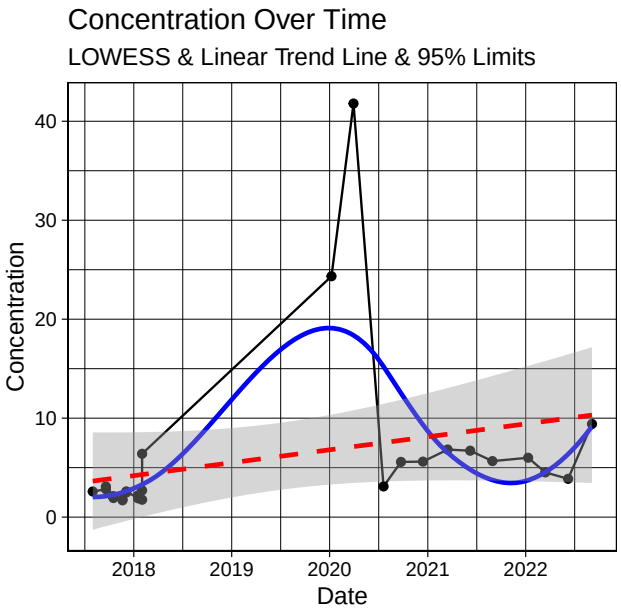
Report for ID : MW141 and Analyte : PFHxSandPFOS

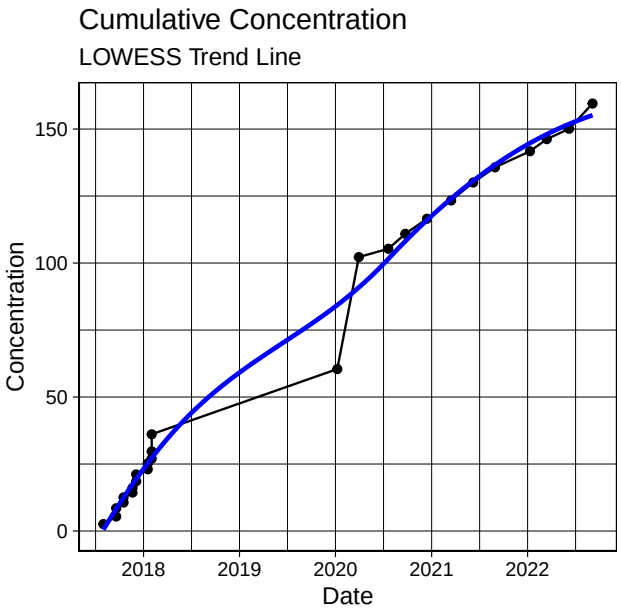




Kendall Trend Test Results Continuous	
n	26
z	3.09
p	0
S	141
varS	2058.33
tau	0.43
mean	6.14
sd	8.55
cov	1.39
results	INCREASING

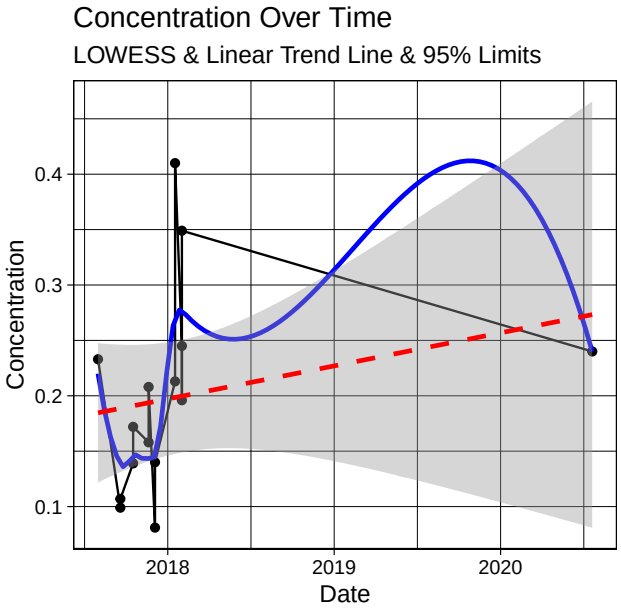
Report for ID : MW142 and Analyte : PFHxSandPFOS

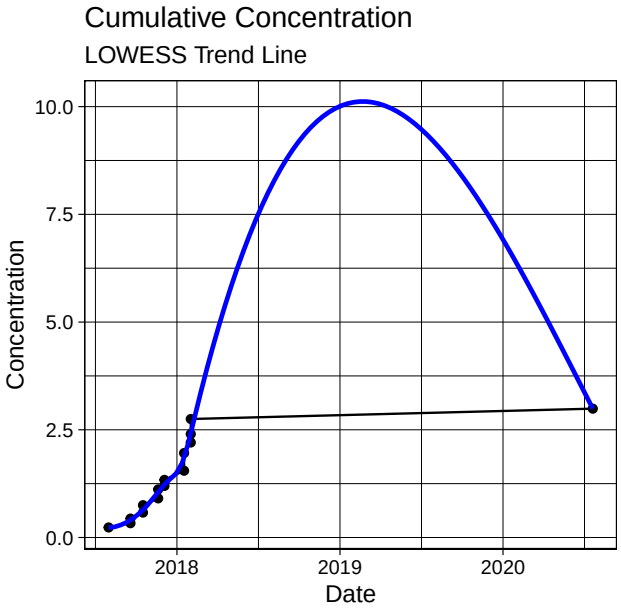




Kendall Trend Test Results Continuous	
n	15
z	2.28
p	0.02
S	47
varS	408.33
tau	0.45
mean	0.2
sd	0.09
cov	0.45
results	INCREASING

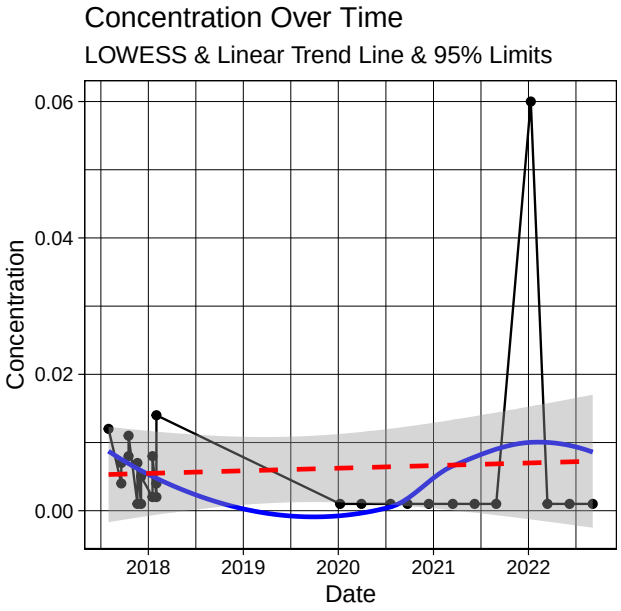
Report for ID : MW147 and Analyte : PFHxSandPFOS

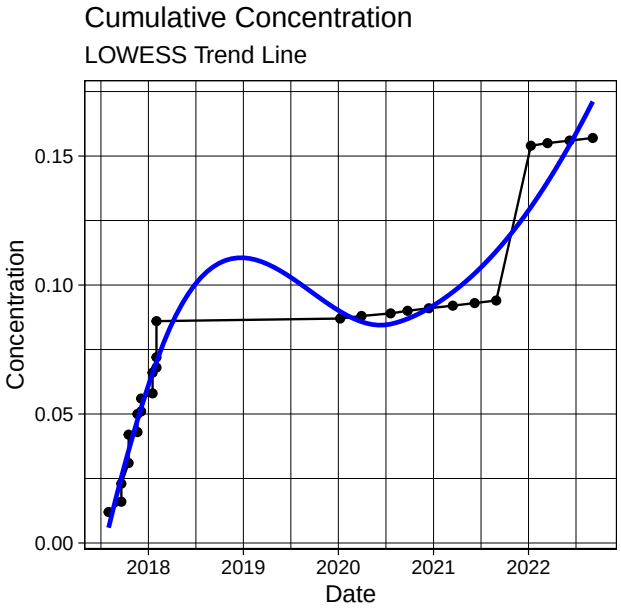




Kendall Trend Test Results Continuous	
n	26
z	-2.84
p	0
S	-121
varS	1785.67
tau	-0.43
mean	0.01
sd	0.01
cov	1.94
results	DECREASING

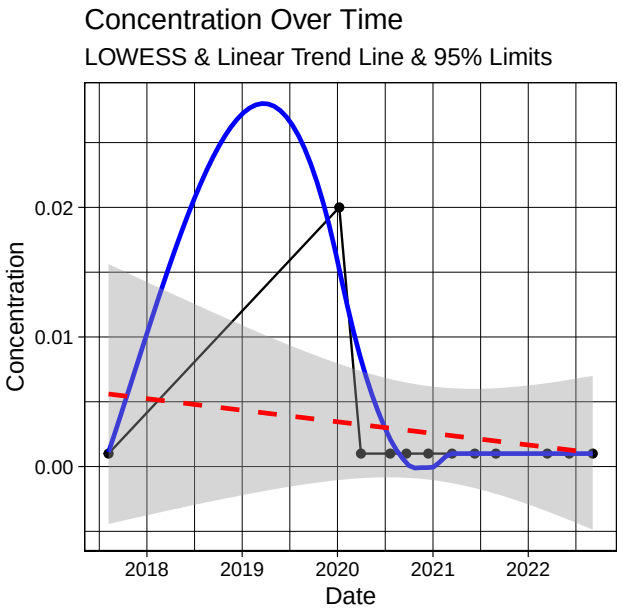
Report for ID : MW149 and Analyte : PFHxSandPFOS

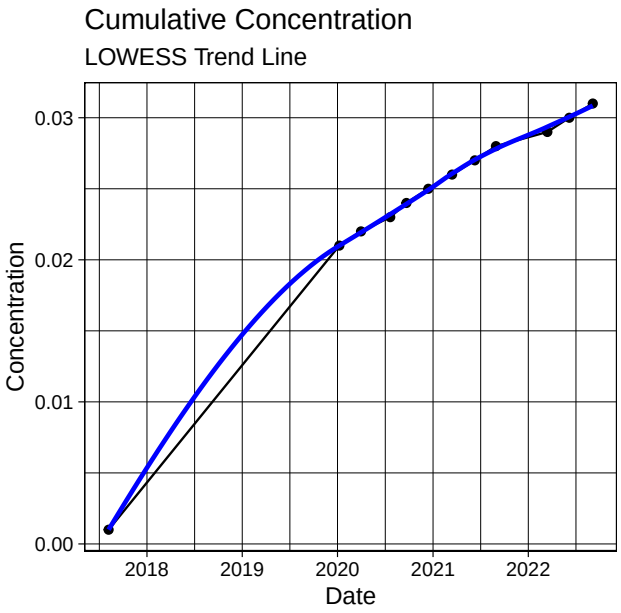




Kendall Trend Test Results Continuous	
n	12
z	-1.16
p	0.25
S	-9
varS	47.67
tau	-0.33
mean	0
sd	0.01
cov	2.12
results	NO CLEAR TREND

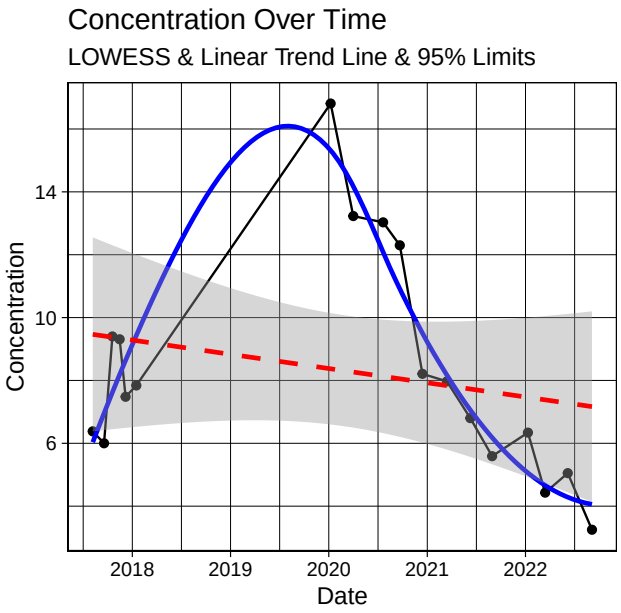
Report for ID : MW158 and Analyte : PFHxSandPFOS

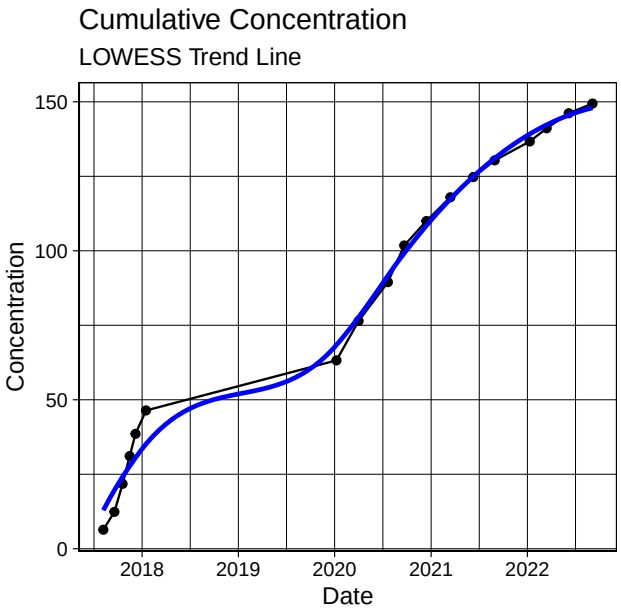




Kendall Trend Test Results Continuous	
n	18
z	-2.27
p	0.02
S	-61
varS	697
tau	-0.4
mean	8.3
sd	3.53
cov	0.43
results	DECREASING

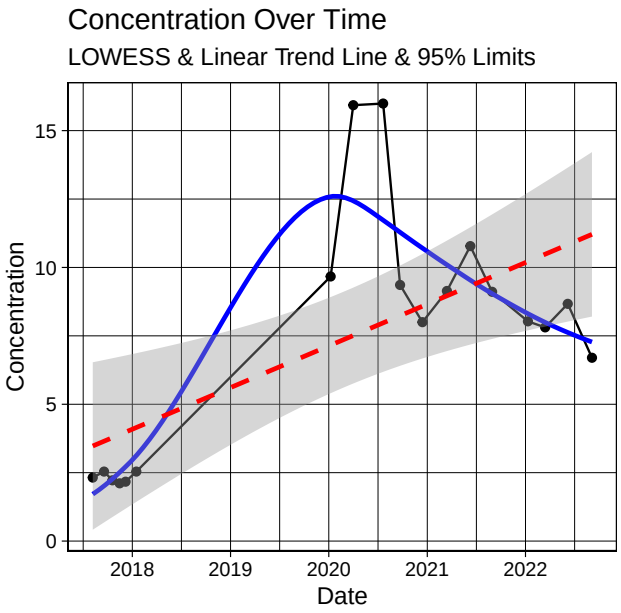
Report for ID : MW161 and Analyte : PFHxSandPFOS

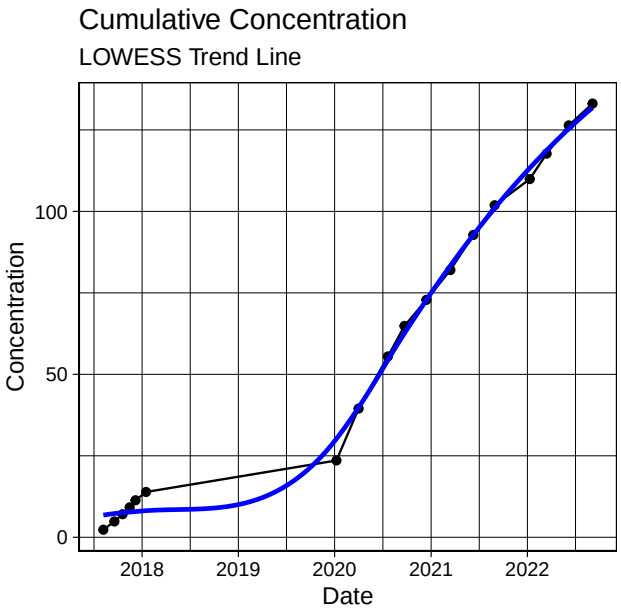




Kendall Trend Test Results Continuous	
n	18
z	1.1
p	0.27
S	30
varS	696
tau	0.2
mean	7.39
sd	4.41
cov	0.6
results	NO CLEAR TREND

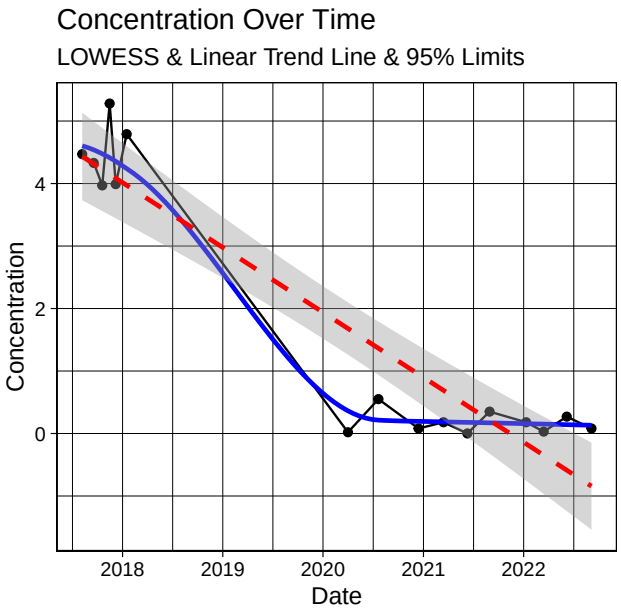
Report for ID : MW166 and Analyte : PFHxSandPFOS

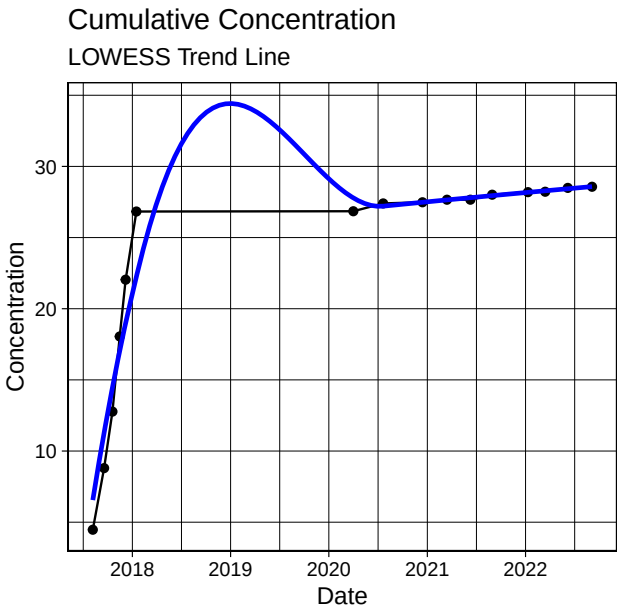




Kendall Trend Test Results Continuous	
n	16
z	-2.57
p	0.01
S	-58
varS	491.33
tau	-0.49
mean	1.79
sd	2.17
cov	1.22
results	DECREASING

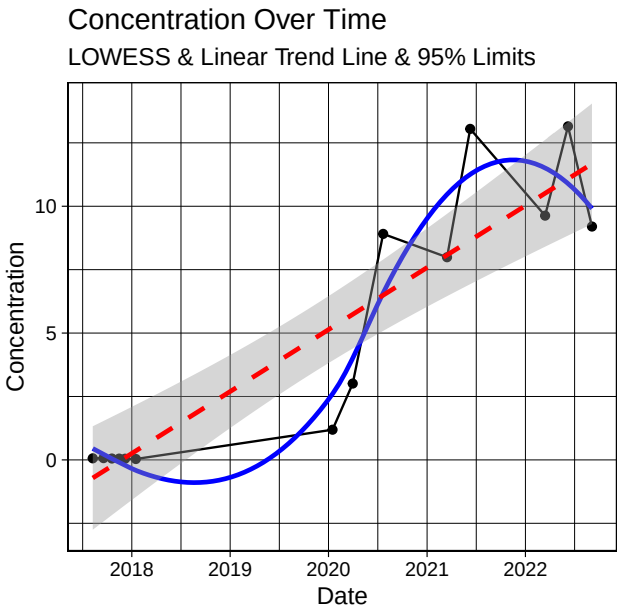
Report for ID : MW171 and Analyte : PFHxSandPFOS

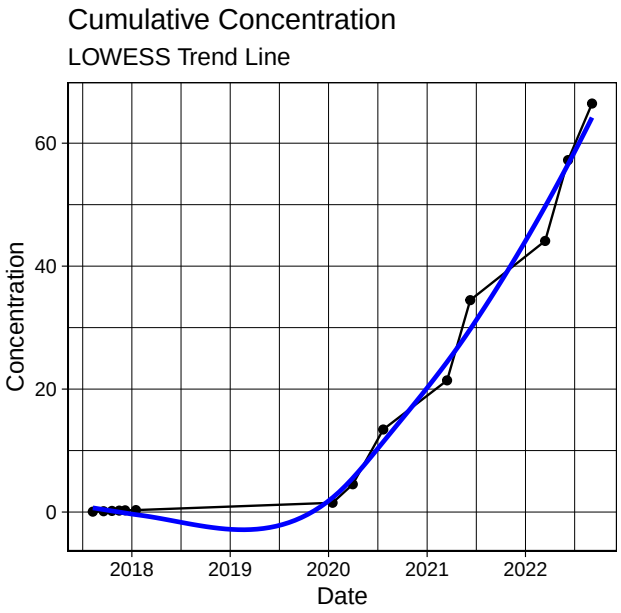




Kendall Trend Test Results Continuous	
n	14
z	2.85
p	0
S	53
varS	333.67
tau	0.58
mean	4.75
sd	5.25
cov	1.11
results	INCREASING

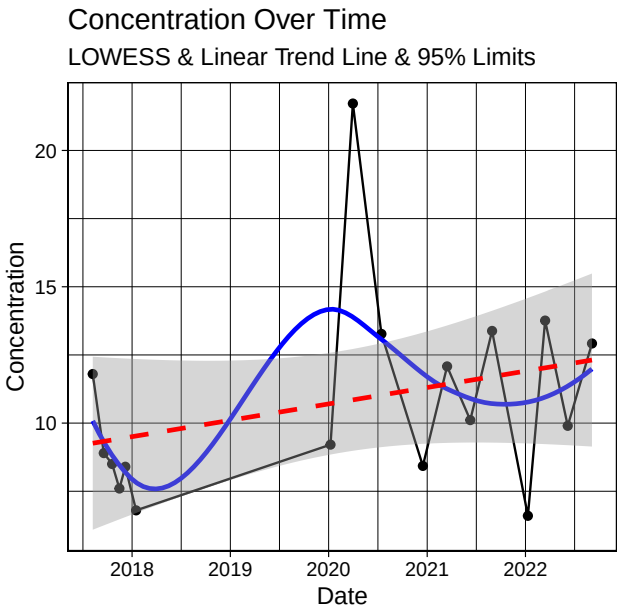
Report for ID : MW173 and Analyte : PFHxSandPFOS

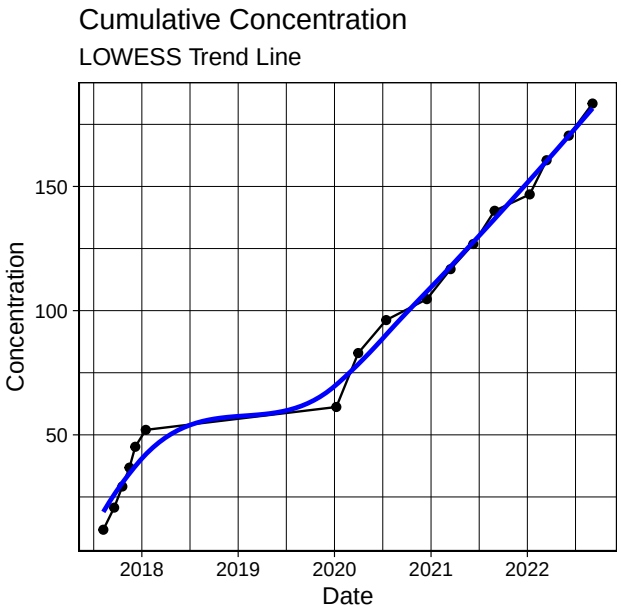




Kendall Trend Test Results Continuous	
n	17
z	1.11
p	0.27
S	28
varS	589.33
tau	0.21
mean	10.79
sd	3.67
cov	0.34
results	NO CLEAR TREND

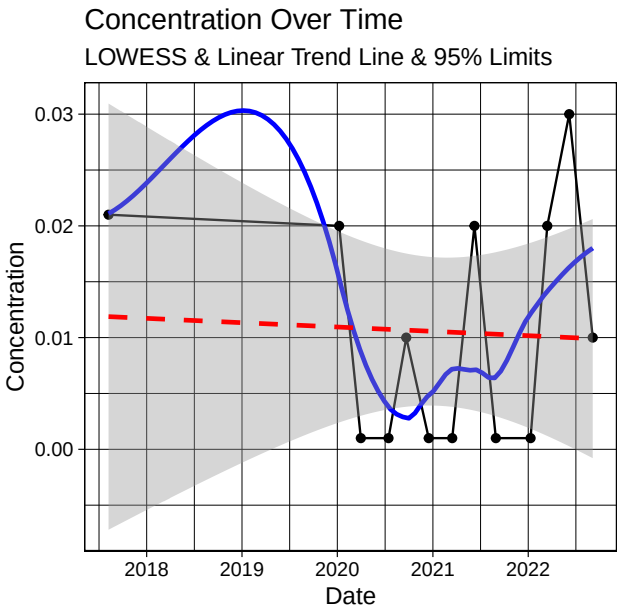
Report for ID : MW193 and Analyte : PFHxSandPFOS

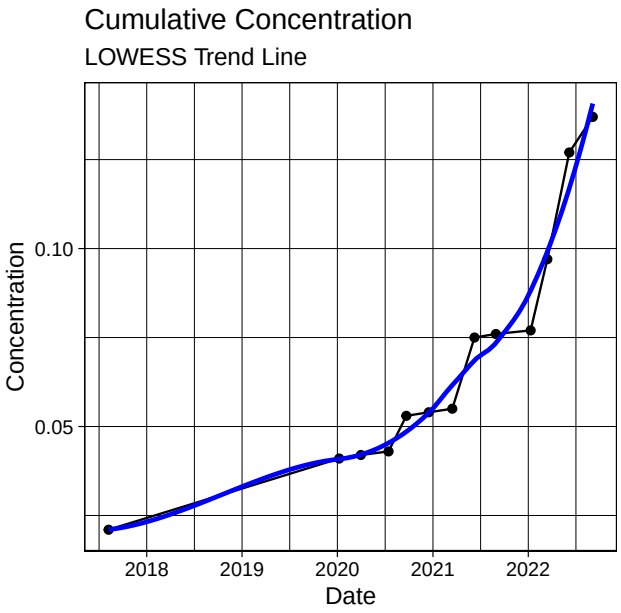




Kendall Trend Test Results Continuous	
n	13
z	0.13
p	0.9
S	3
varS	235.67
tau	0.04
mean	0.01
sd	0.01
cov	0.99
results	NO CLEAR TREND

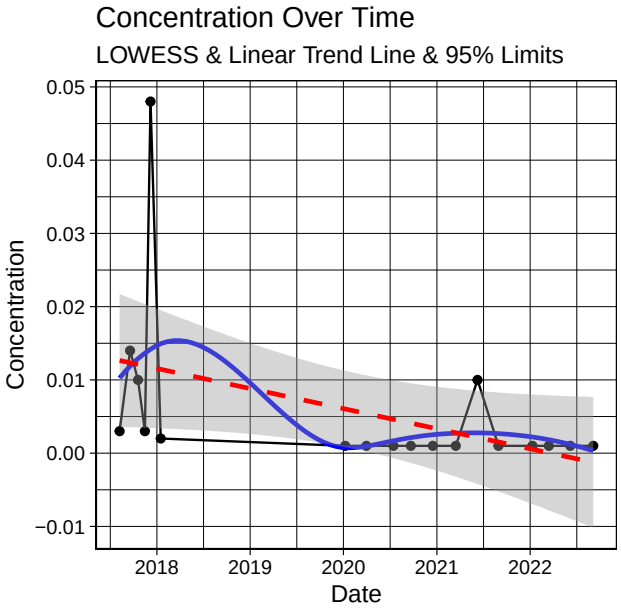
Report for ID : MW195D and Analyte : PFHxSandPFOS

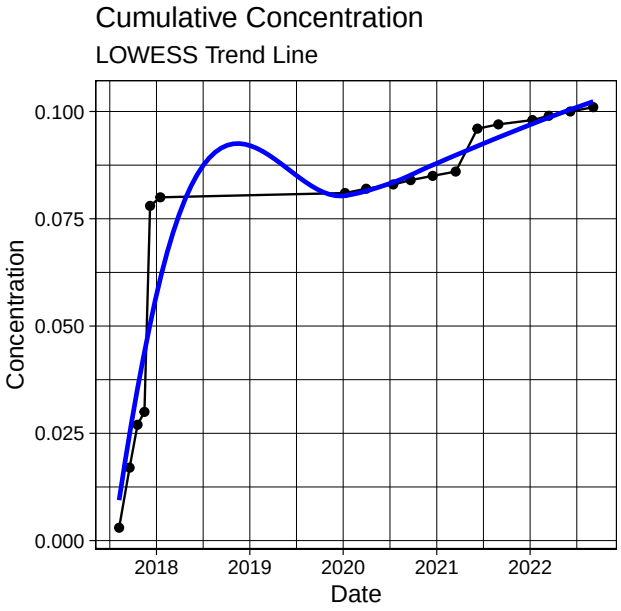




Kendall Trend Test Results Continuous	
n	18
z	-2.82
p	0
S	-66
varS	530
tau	-0.54
mean	0.01
sd	0.01
cov	2.01
results	DECREASING

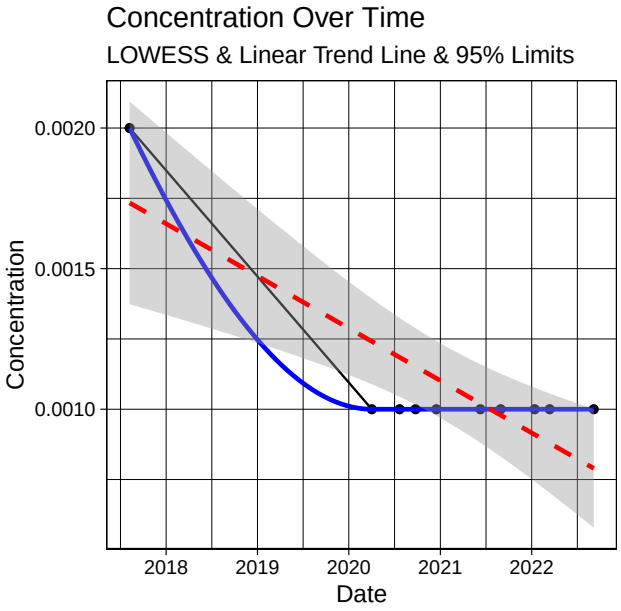
Report for ID : MW195S and Analyte : PFHxSandPFOS

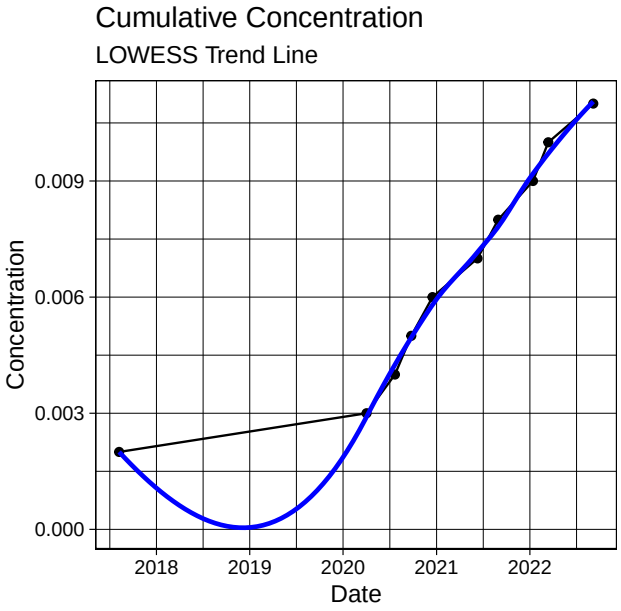




Kendall Trend Test Results Continuous	
n	10
z	-1.39
p	0.16
S	-9
varS	33
tau	-0.45
mean	0
sd	0
cov	0.29
results	STABLE

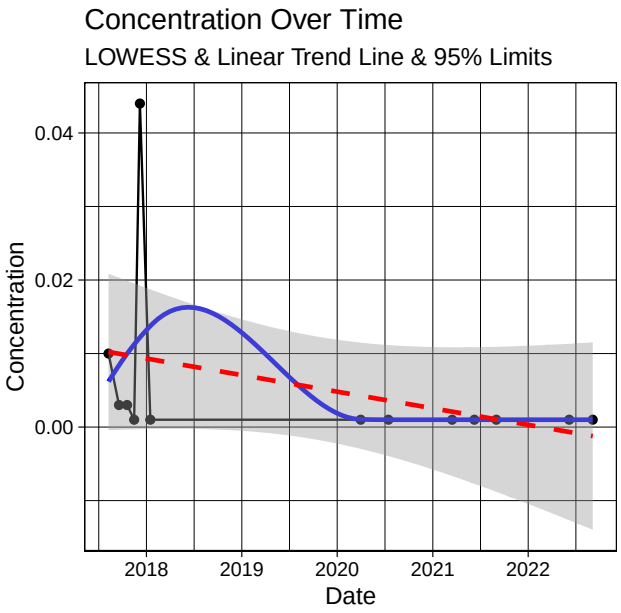
Report for ID : MW196 and Analyte : PFHxSandPFOS

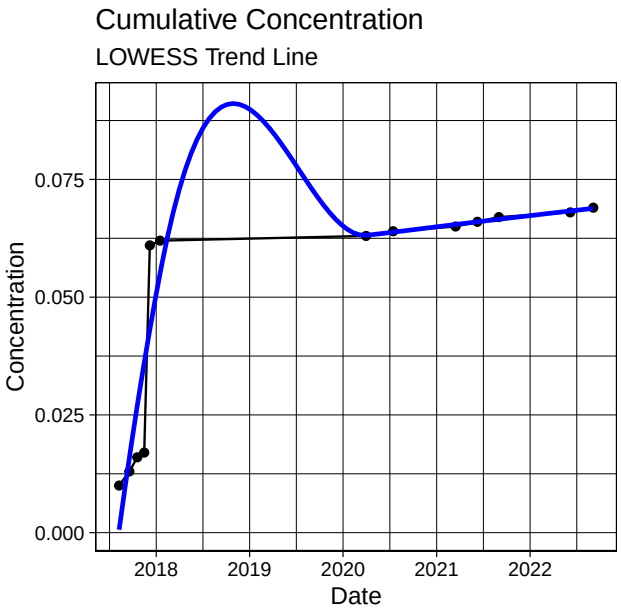




Kendall Trend Test Results Continuous	
n	13
z	-2.41
p	0.02
S	-33
varS	175.67
tau	-0.58
mean	0.01
sd	0.01
cov	2.24
results	DECREASING

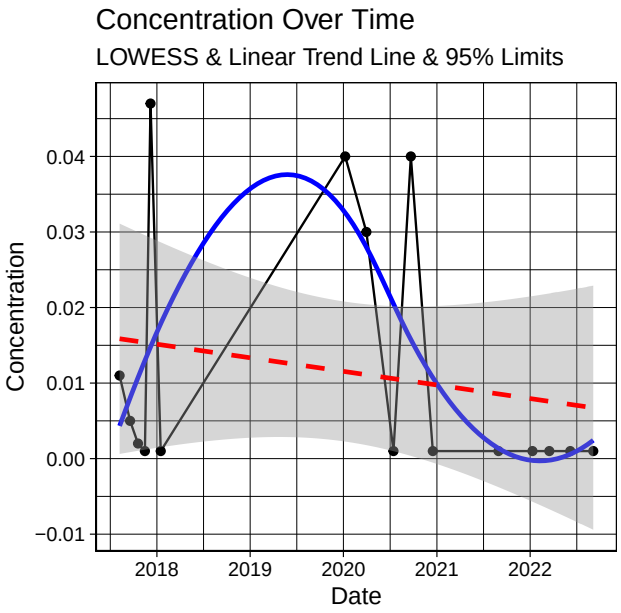
Report for ID : MW197 and Analyte : PFHxSandPFOS

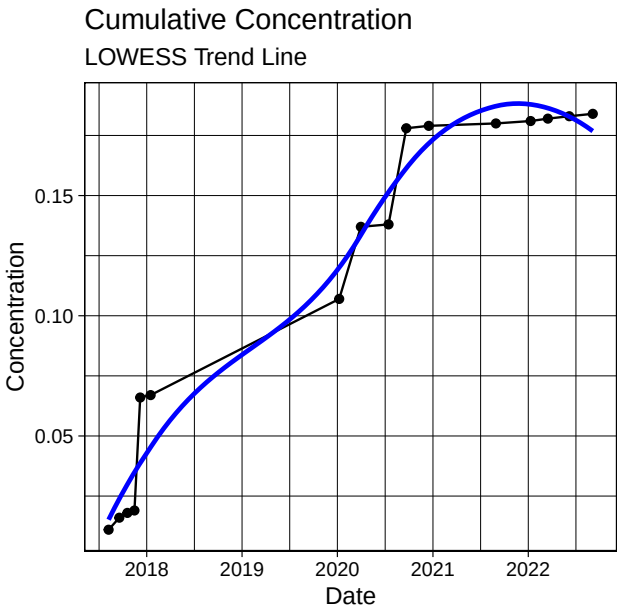




Kendall Trend Test Results Continuous	
n	16
z	-2
p	0.05
S	-41
varS	400.33
tau	-0.41
mean	0.01
sd	0.02
cov	1.48
results	DECREASING

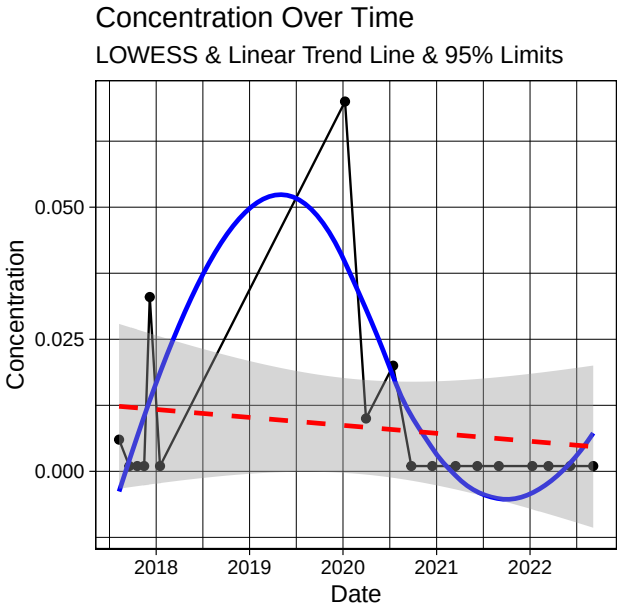
Report for ID : MW199 and Analyte : PFHxSandPFOS

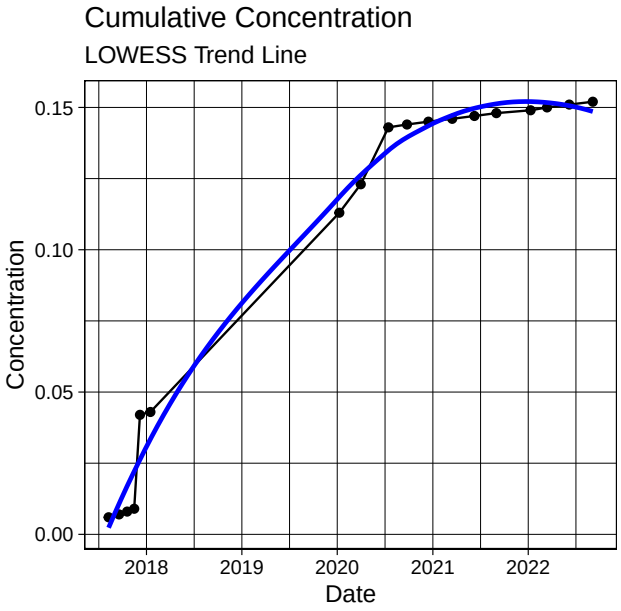




Kendall Trend Test Results Continuous	
n	18
z	-1.55
p	0.12
S	-33
varS	428.33
tau	-0.31
mean	0.01
sd	0.02
cov	2.08
results	NO CLEAR TREND

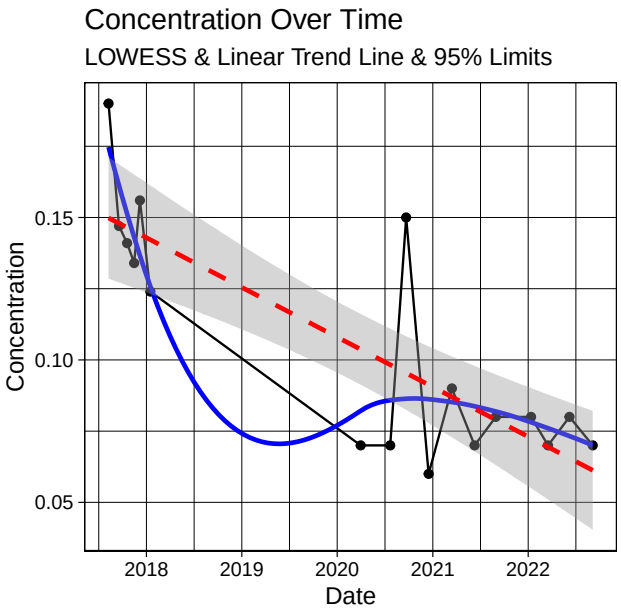
Report for ID : MW200 and Analyte : PFHxSandPFOS

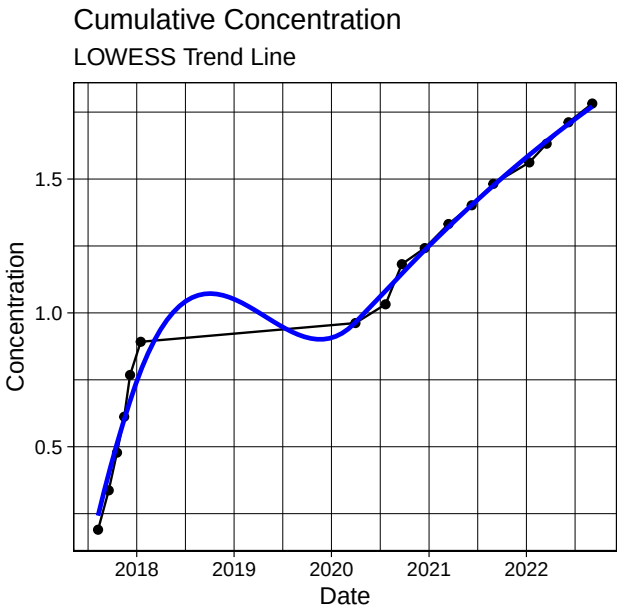




Kendall Trend Test Results Continuous	
n	17
z	-2.77
p	0.01
S	-67
varS	569
tau	-0.52
mean	0.1
sd	0.04
cov	0.39
results	DECREASING

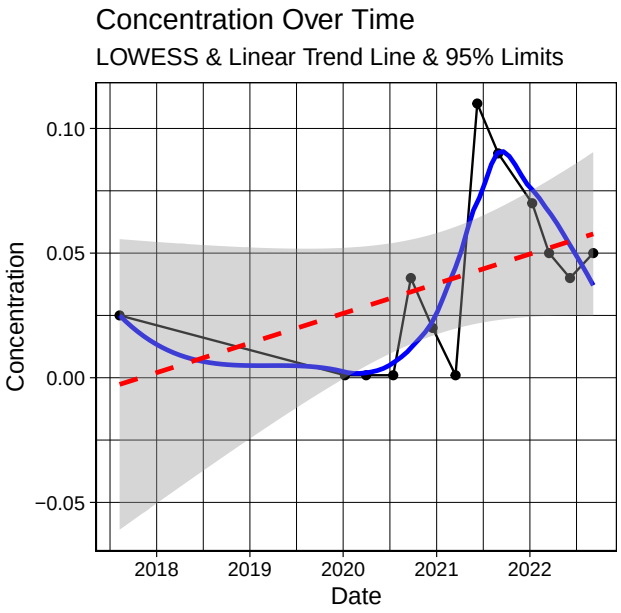
Report for ID : MW202 and Analyte : PFHxSandPFOS

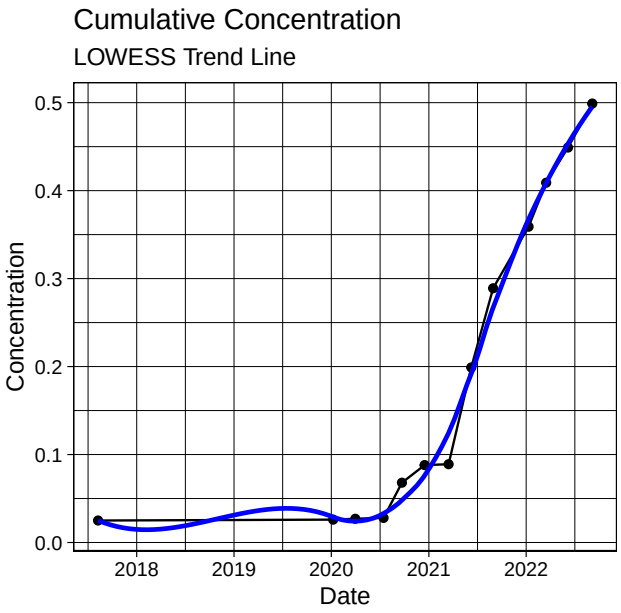




Kendall Trend Test Results Continuous	
n	13
z	1.68
p	0.09
S	28
varS	258
tau	0.38
mean	0.04
sd	0.04
cov	0.93
results	POSSIBLY INCREASING

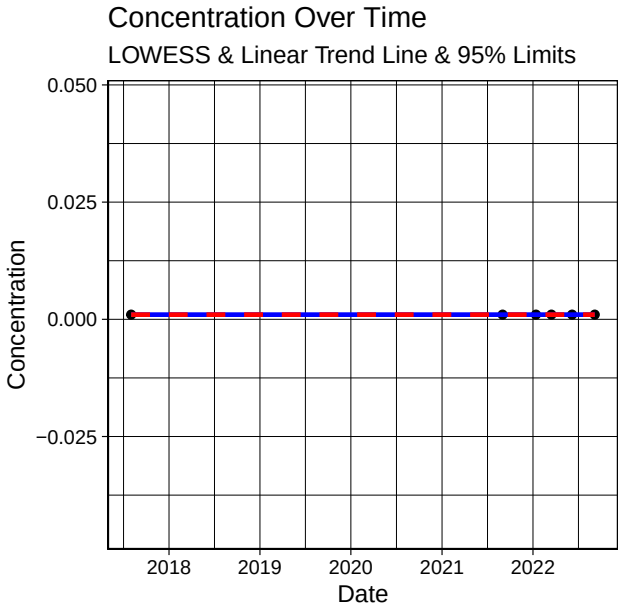
Report for ID : MW203 and Analyte : PFHxSandPFOS

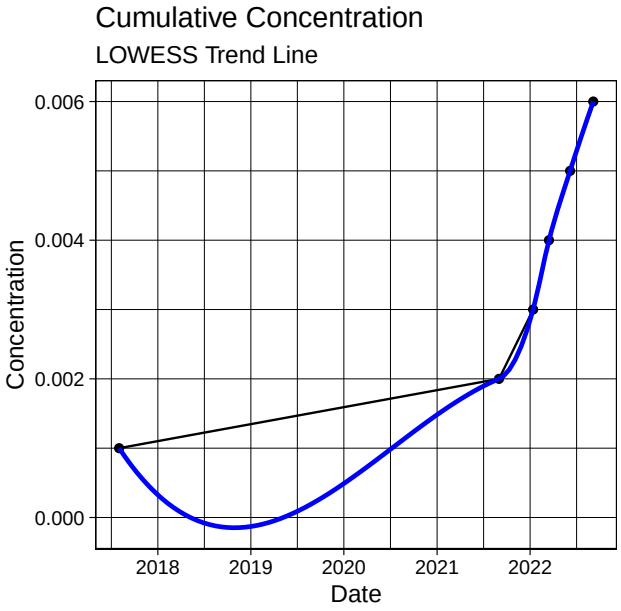




Kendall Trend Test Results Continuous	
n	6
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

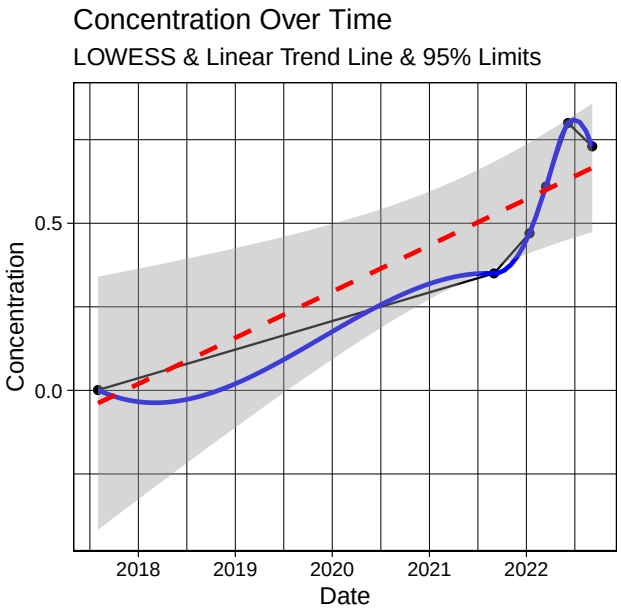
Report for ID : MW214 and Analyte : PFHxSandPFOS

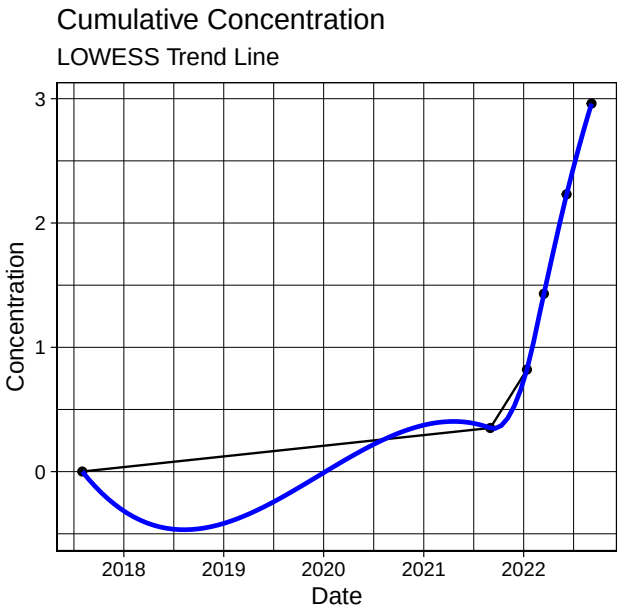




Kendall Trend Test Results Continuous	
n	6
z	2.25
p	0.02
S	13
varS	28.33
tau	0.87
mean	0.49
sd	0.29
cov	0.59
results	INCREASING

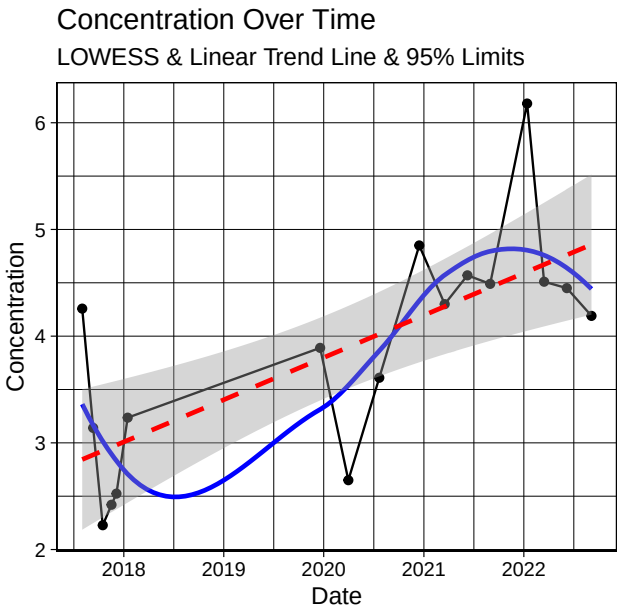
Report for ID : MW215 and Analyte : PFHxSandPFOS

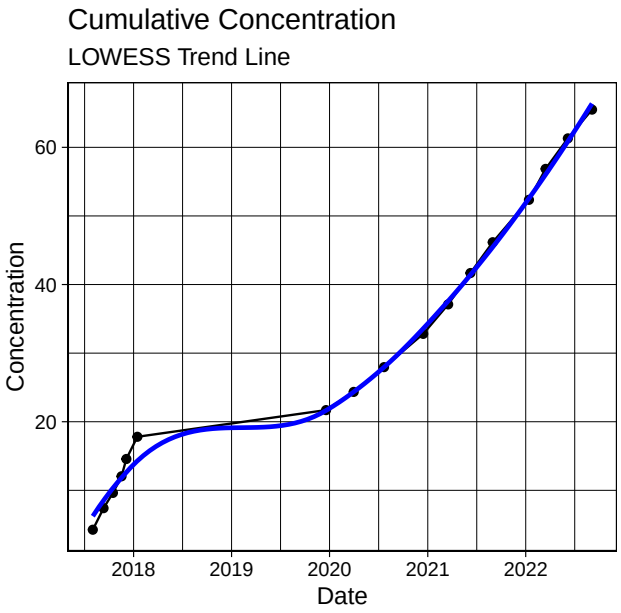




Kendall Trend Test Results Continuous	
n	17
z	2.68
p	0.01
S	66
varS	589.33
tau	0.49
mean	3.85
sd	1.04
cov	0.27
results	INCREASING

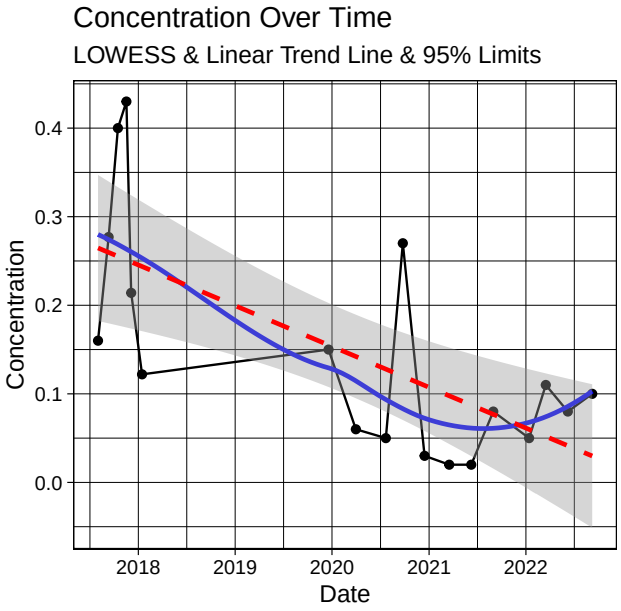
Report for ID : MW216 and Analyte : PFHxSandPFOS

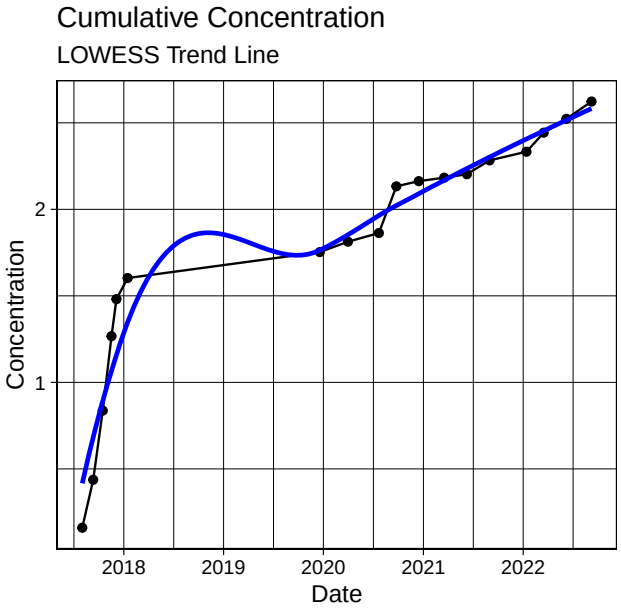




Kendall Trend Test Results Continuous	
n	18
z	-2.39
p	0.02
S	-64
varS	694
tau	-0.42
mean	0.15
sd	0.13
cov	0.86
results	DECREASING

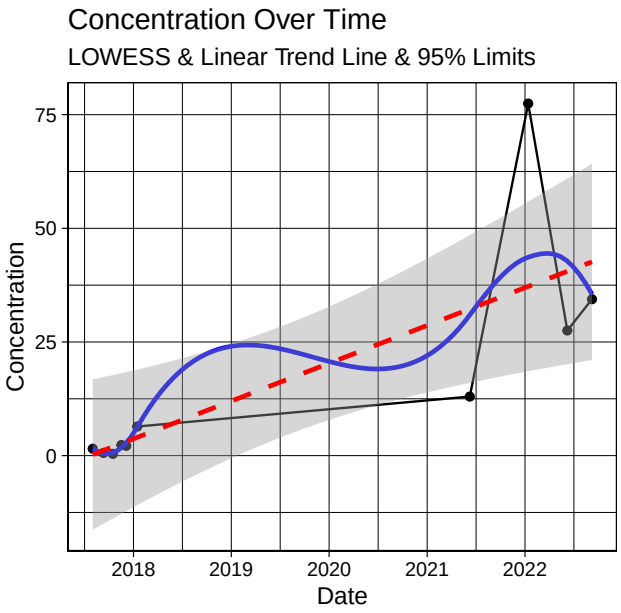
Report for ID : MW217 and Analyte : PFHxSandPFOS

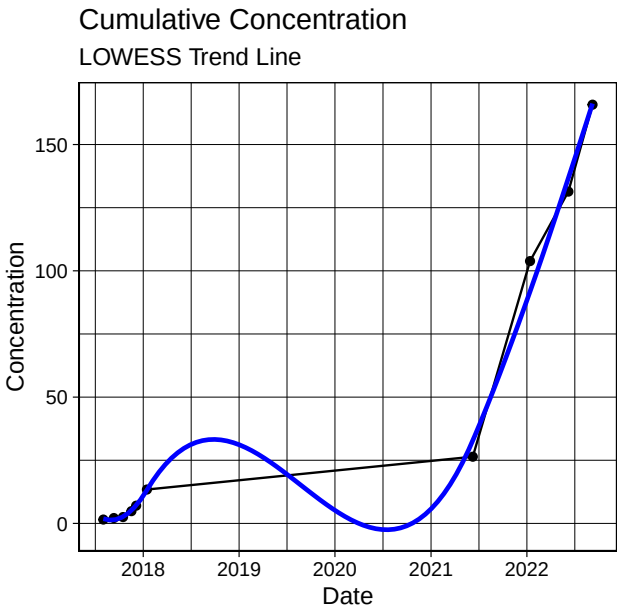




Kendall Trend Test Results Continuous	
n	10
z	2.86
p	0
S	33
varS	125
tau	0.73
mean	16.58
sd	24.53
cov	1.48
results	INCREASING

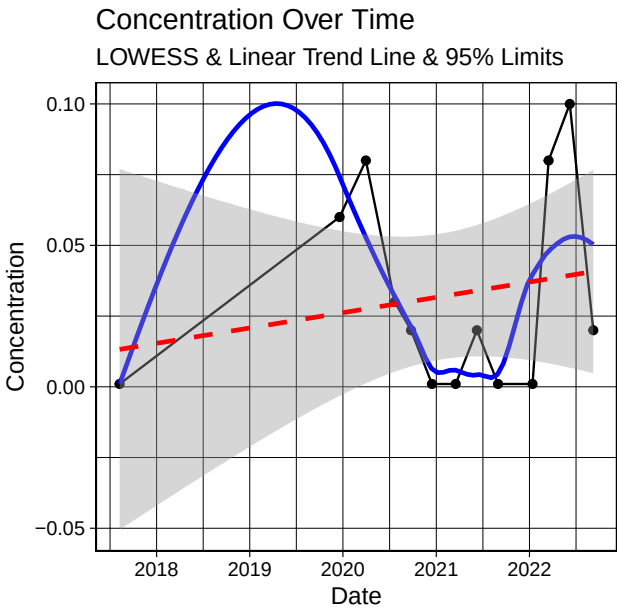
Report for ID : MW220 and Analyte : PFHxSandPFOS

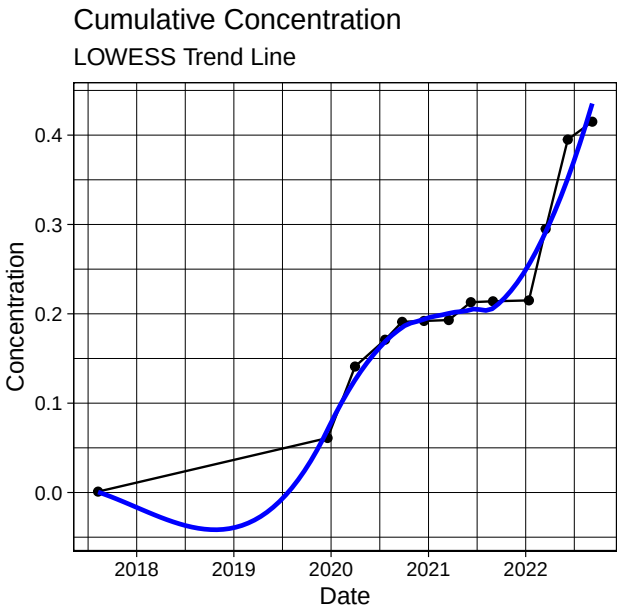




Kendall Trend Test Results Continuous	
n	13
z	0.06
p	0.95
S	2
varS	247.33
tau	0.03
mean	0.03
sd	0.04
cov	1.12
results	NO CLEAR TREND

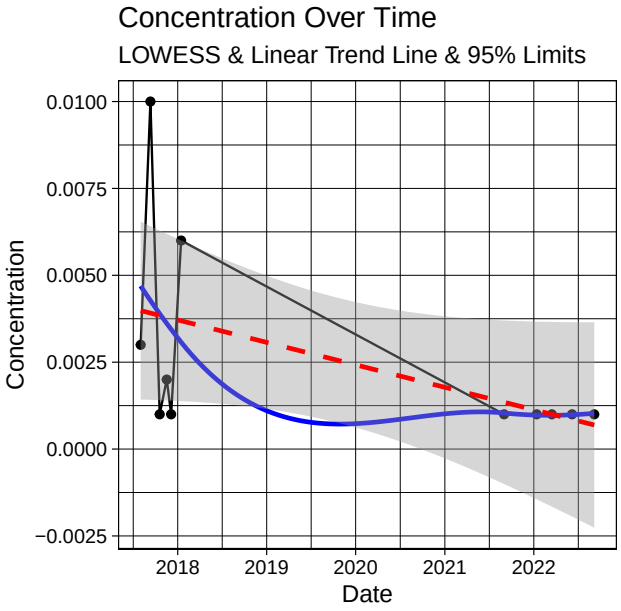
Report for ID : MW224 and Analyte : PFHxSandPFOS

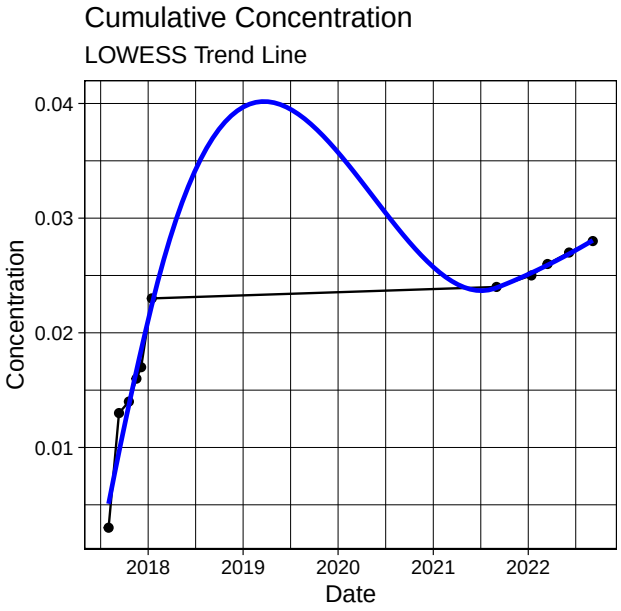




Kendall Trend Test Results Continuous	
n	11
z	-1.91
p	0.06
S	-22
varS	120.67
tau	-0.51
mean	0
sd	0
cov	1.14
results	POSSIBLY DECREASING

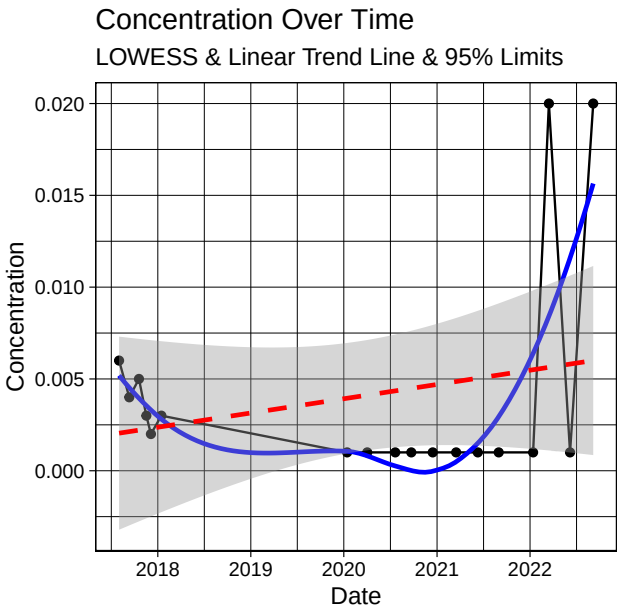
Report for ID : MW225 and Analyte : PFHxSandPFOS

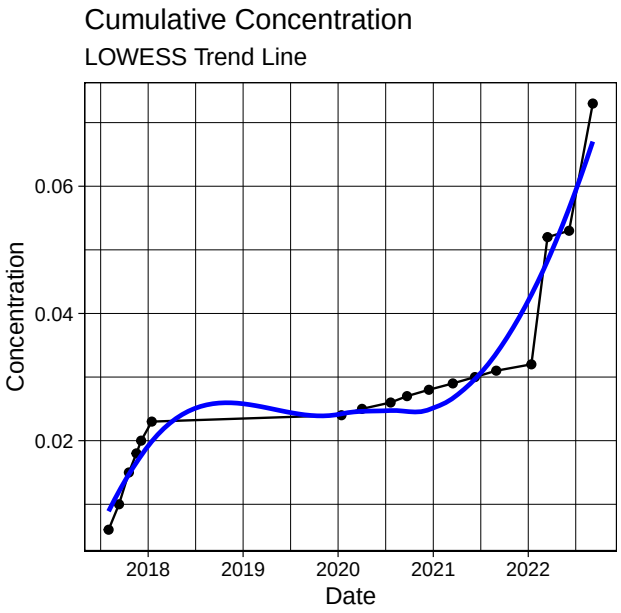




Kendall Trend Test Results Continuous	
n	18
z	-1.63
p	0.1
S	-40
varS	570
tau	-0.31
mean	0
sd	0.01
cov	1.48
results	NO CLEAR TREND

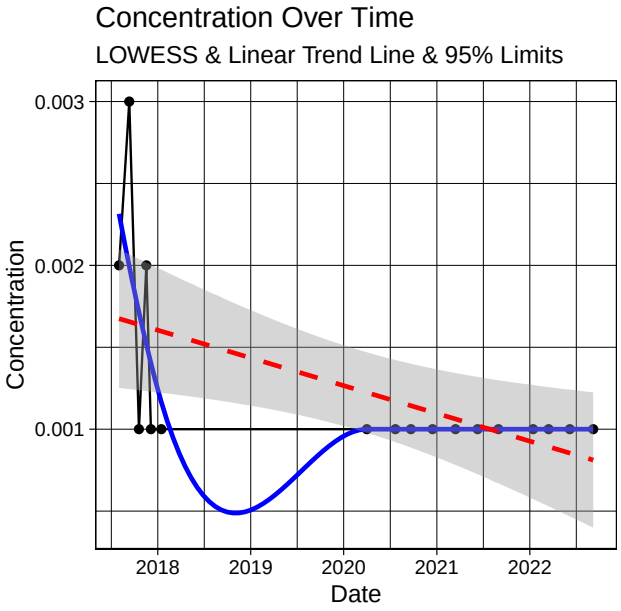
Report for ID : MW226 and Analyte : PFHxSandPFOS

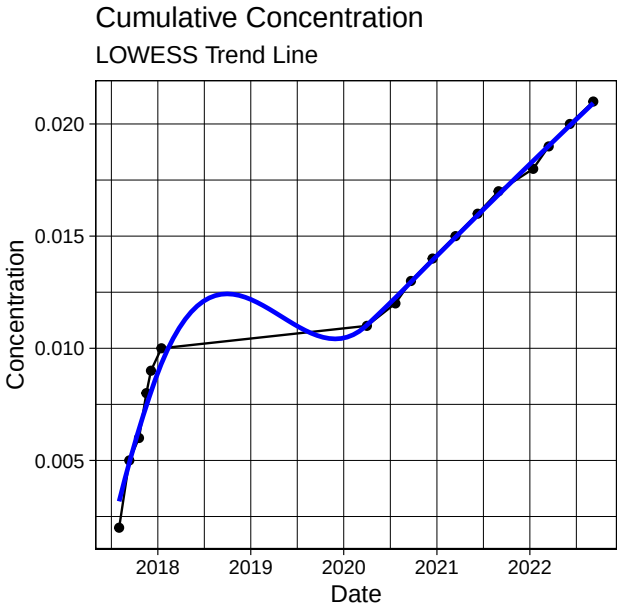




Kendall Trend Test Results Continuous	
n	17
z	-2.44
p	0.01
S	-40
varS	254.67
tau	-0.52
mean	0
sd	0
cov	0.46
results	DECREASING

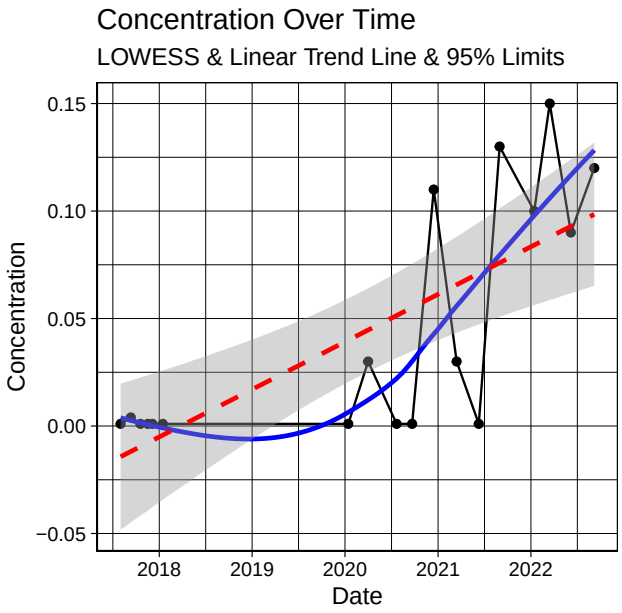
Report for ID : MW227 and Analyte : PFHxSandPFOS

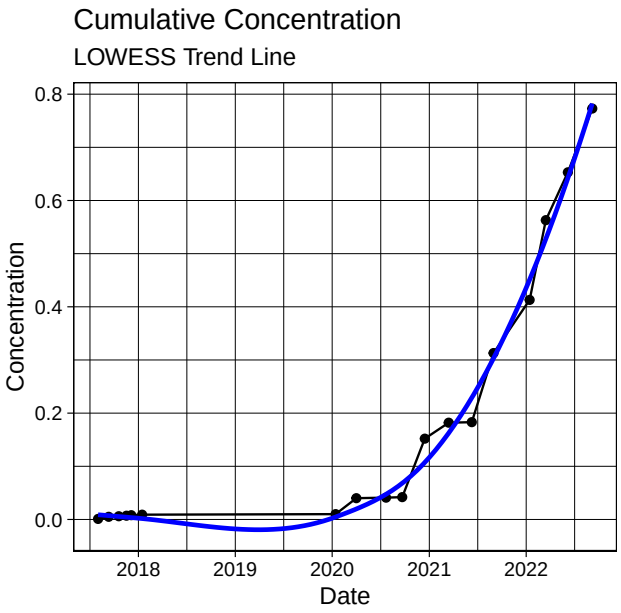




Kendall Trend Test Results Continuous	
n	18
z	2.89
p	0
S	72
varS	604
tau	0.54
mean	0.04
sd	0.06
cov	1.3
results	INCREASING

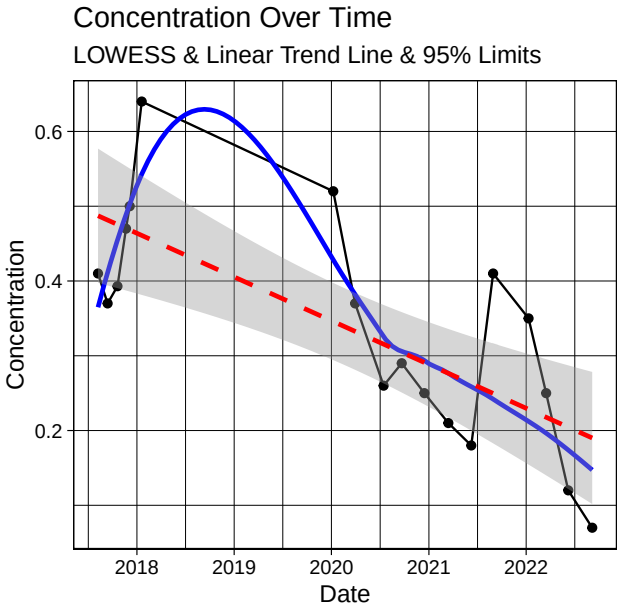
Report for ID : MW228 and Analyte : PFHxSandPFOS

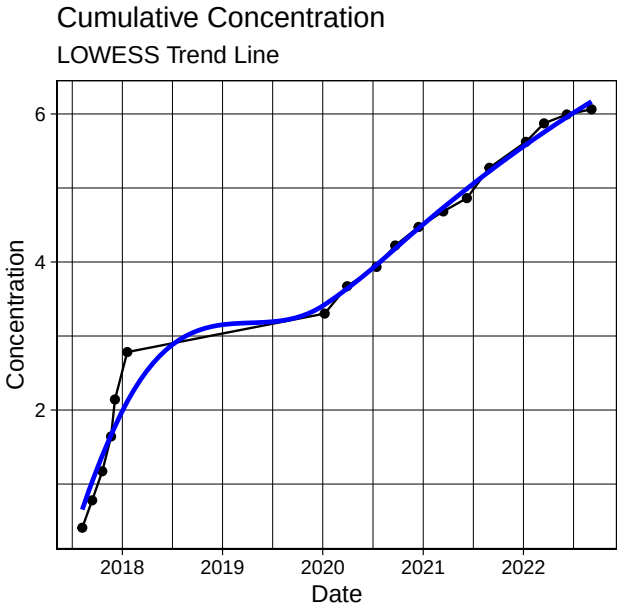




Kendall Trend Test Results Continuous	
n	18
z	-3.07
p	0
S	-82
varS	694
tau	-0.54
mean	0.34
sd	0.15
cov	0.44
results	DECREASING

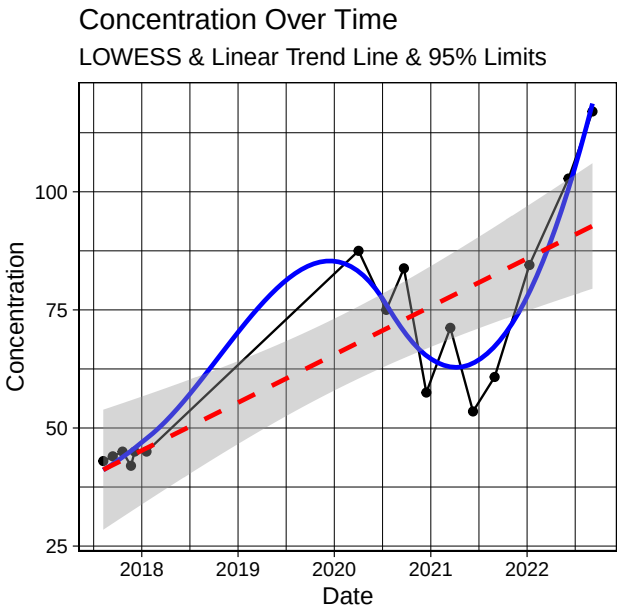
Report for ID : MW233 and Analyte : PFHxSandPFOS

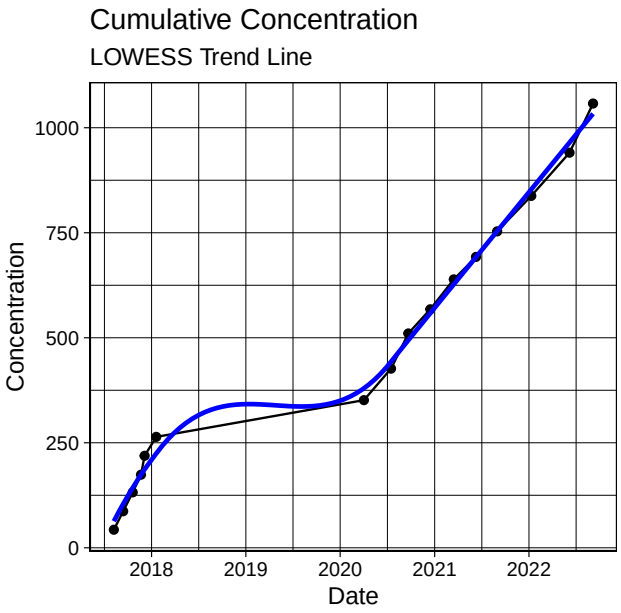




Kendall Trend Test Results Continuous	
n	16
z	3.34
p	0
S	75
varS	489.67
tau	0.63
mean	66.1
sd	23.6
cov	0.36
results	INCREASING

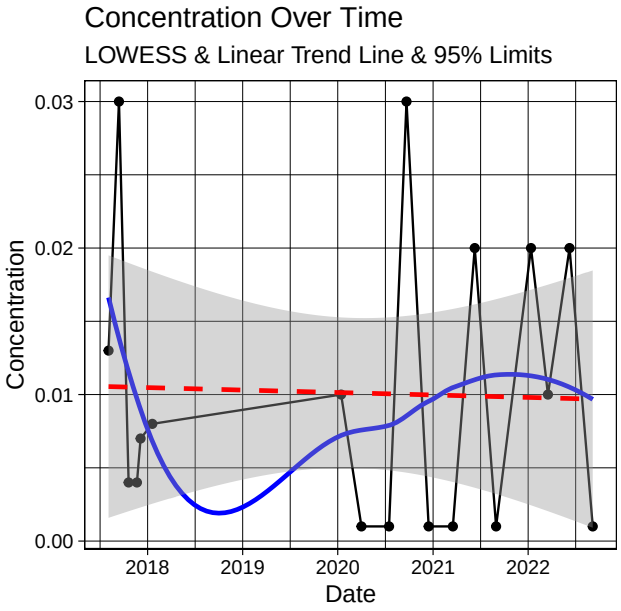
Report for ID : MW236 and Analyte : PFHxSandPFOS

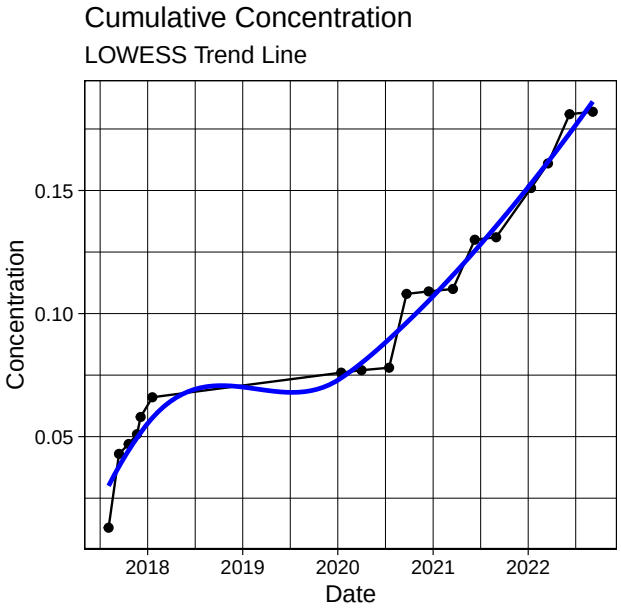




Kendall Trend Test Results Continuous	
n	18
z	-0.43
p	0.67
S	-12
varS	662
tau	-0.08
mean	0.01
sd	0.01
cov	0.98
results	STABLE

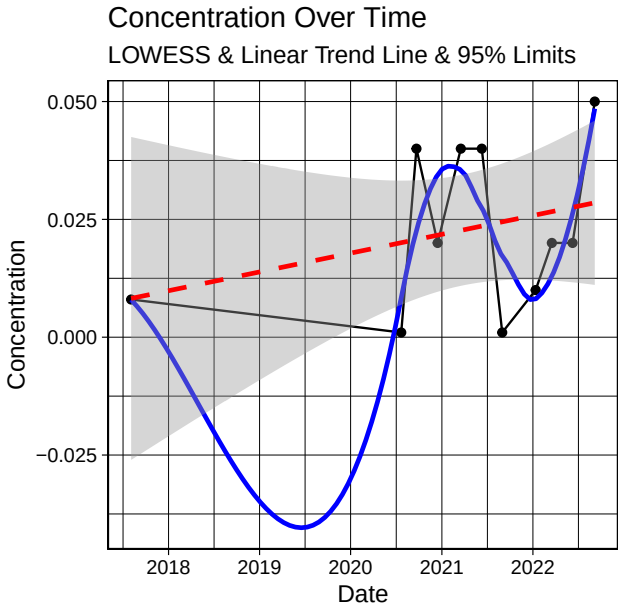
Report for ID : MW238 and Analyte : PFHxSandPFOS

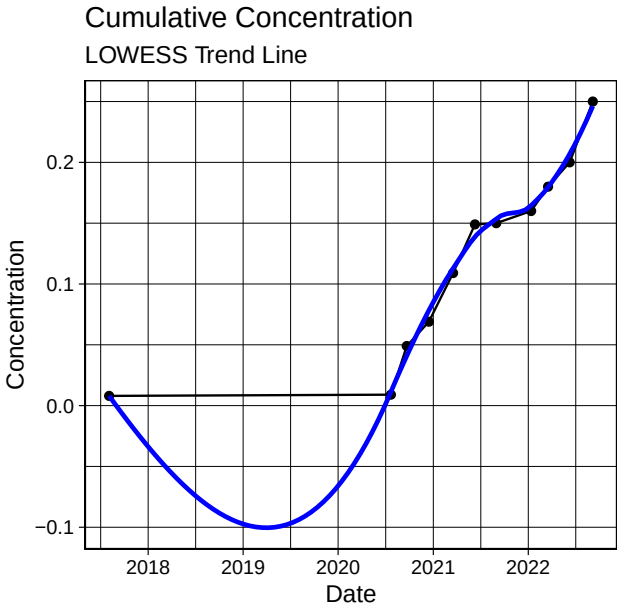




Kendall Trend Test Results Continuous	
n	11
z	1.04
p	0.3
S	14
varS	156.67
tau	0.27
mean	0.02
sd	0.02
cov	0.76
results	NO CLEAR TREND

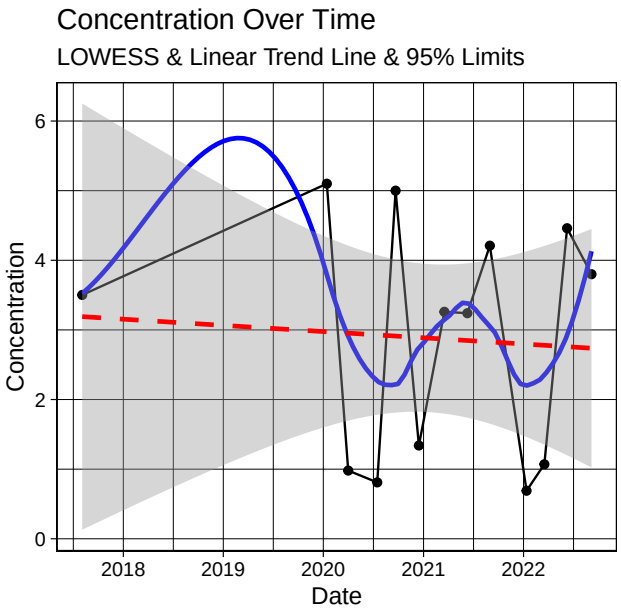
Report for ID : MW239 and Analyte : PFHxSandPFOS

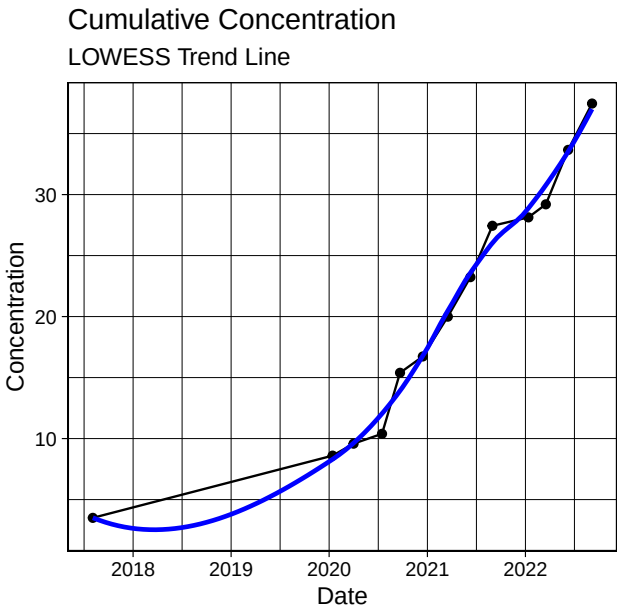




Kendall Trend Test Results Continuous	
n	13
z	-0.06
p	0.95
S	-2
varS	268.67
tau	-0.03
mean	2.88
sd	1.67
cov	0.58
results	STABLE

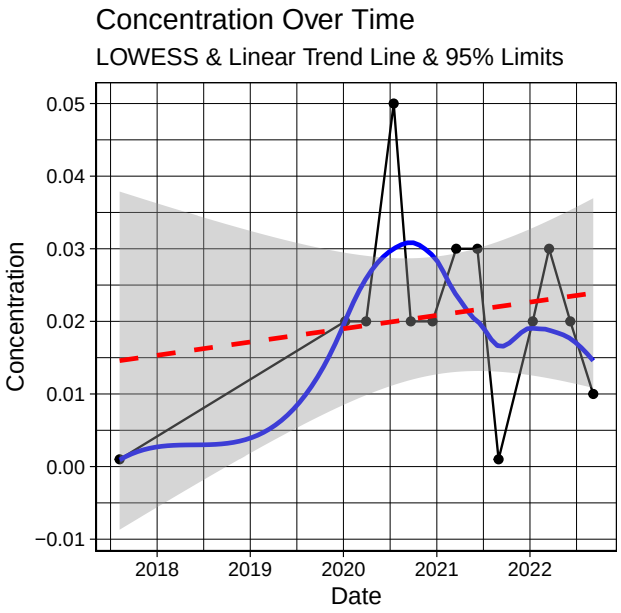
Report for ID : MW240 and Analyte : PFHxSandPFOS

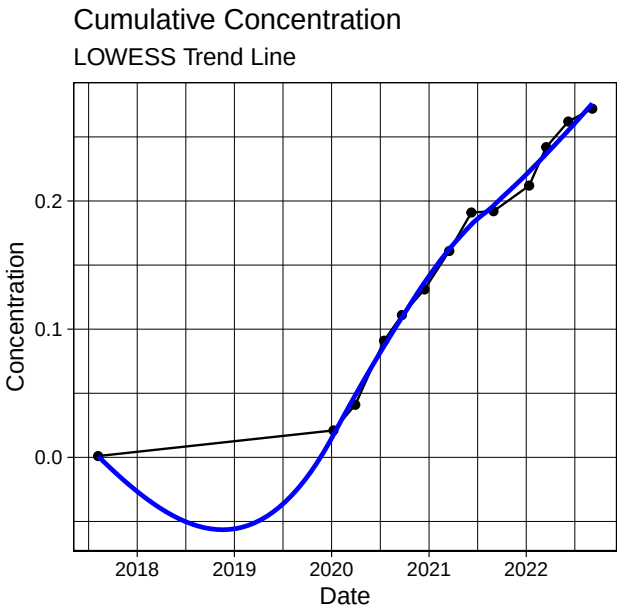




Kendall Trend Test Results Continuous	
n	13
z	0
p	1
S	1
varS	235.67
tau	0.01
mean	0.02
sd	0.01
cov	0.62
results	NO CLEAR TREND

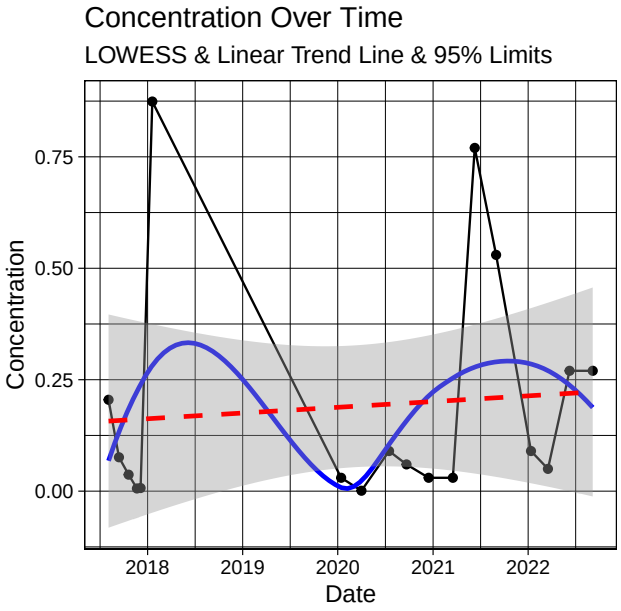
Report for ID : MW242 and Analyte : PFHxSandPFOS

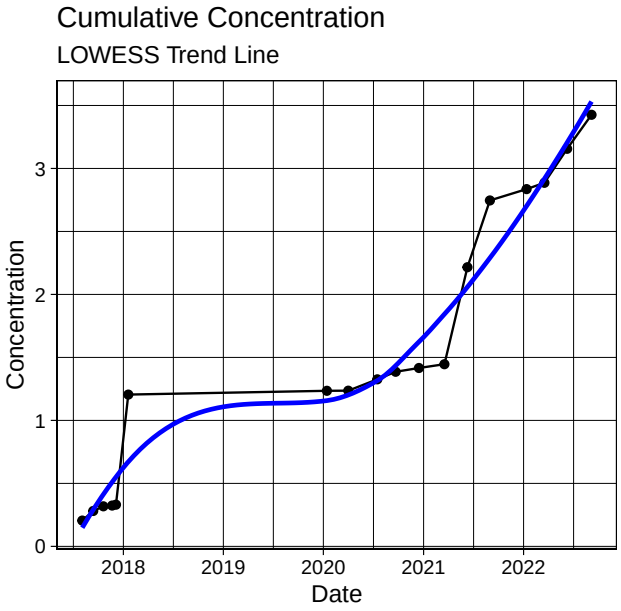




Kendall Trend Test Results Continuous	
n	18
z	1.1
p	0.27
S	30
varS	691.33
tau	0.2
mean	0.19
sd	0.27
cov	1.4
results	NO CLEAR TREND

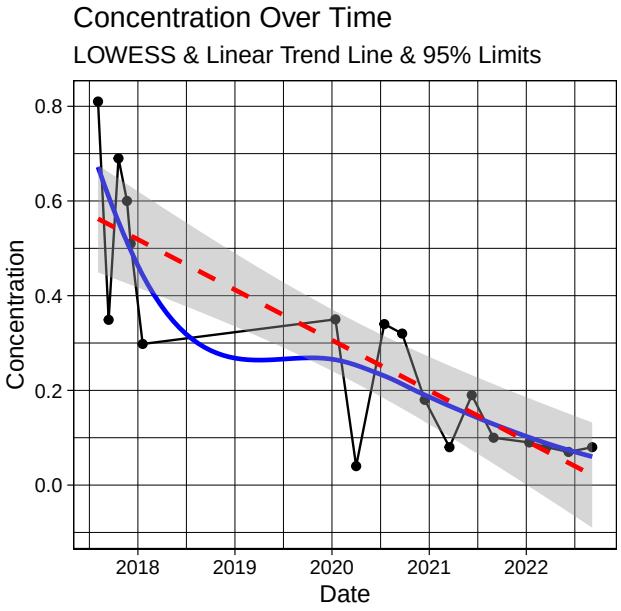
Report for ID : MW243 and Analyte : PFHxSandPFOS

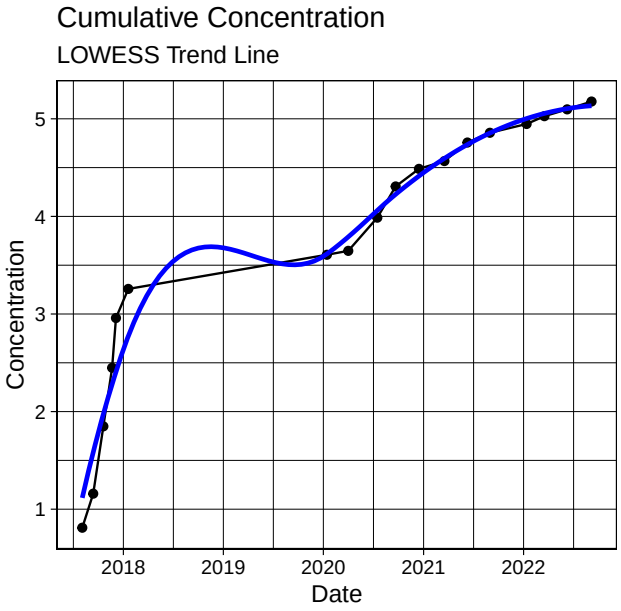




Kendall Trend Test Results Continuous	
n	18
z	-3.99
p	0
S	-106
varS	693.33
tau	-0.7
mean	0.29
sd	0.23
cov	0.81
results	DECREASING

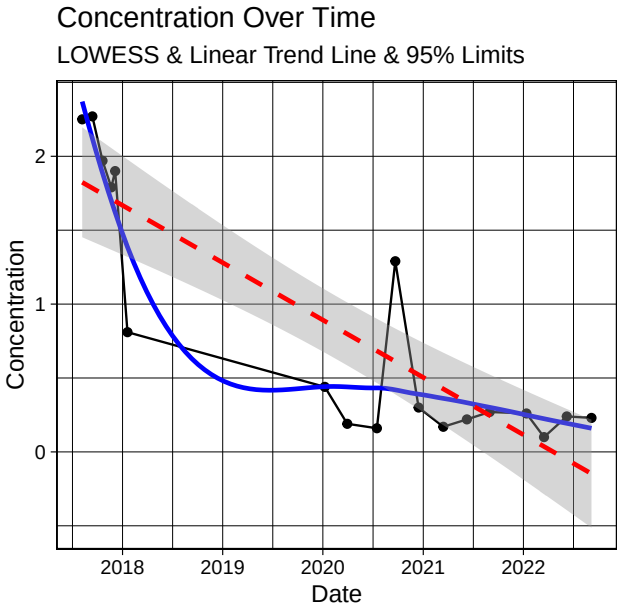
Report for ID : MW245 and Analyte : PFHxSandPFOS

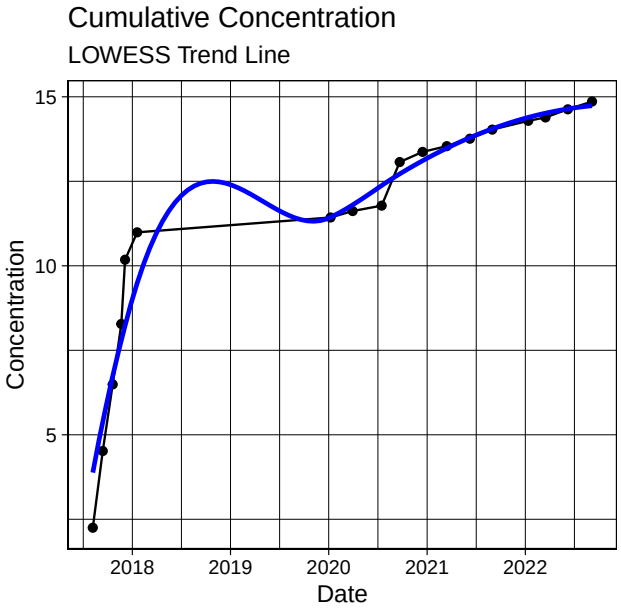




Kendall Trend Test Results Continuous	
n	18
z	-3.48
p	0
S	-93
varS	697
tau	-0.61
mean	0.83
sd	0.83
cov	1
results	DECREASING

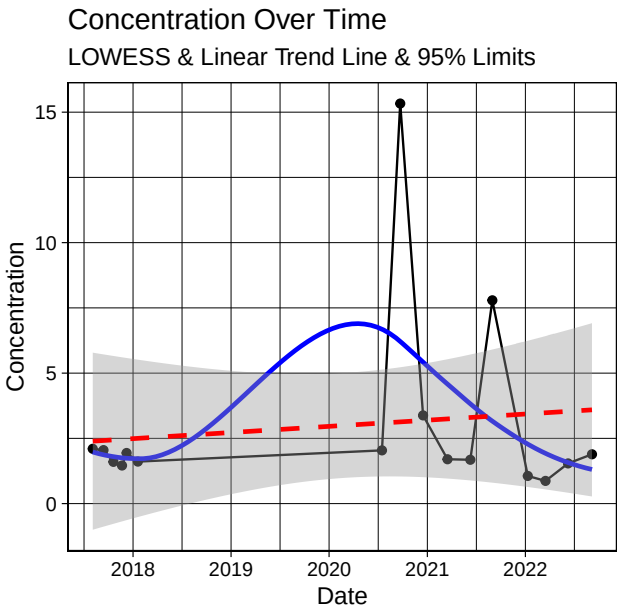
Report for ID : MW249 and Analyte : PFHxSandPFOS

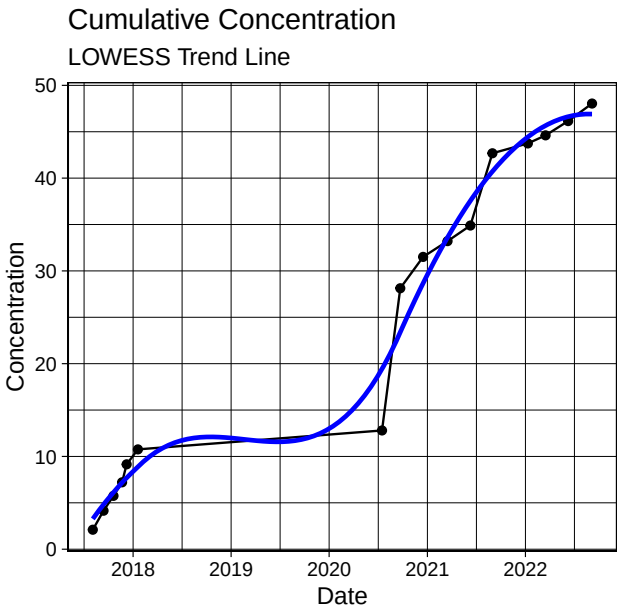




Kendall Trend Test Results Continuous	
n	16
z	-0.95
p	0.34
S	-22
varS	493.33
tau	-0.18
mean	3
sd	3.65
cov	1.22
results	NO CLEAR TREND

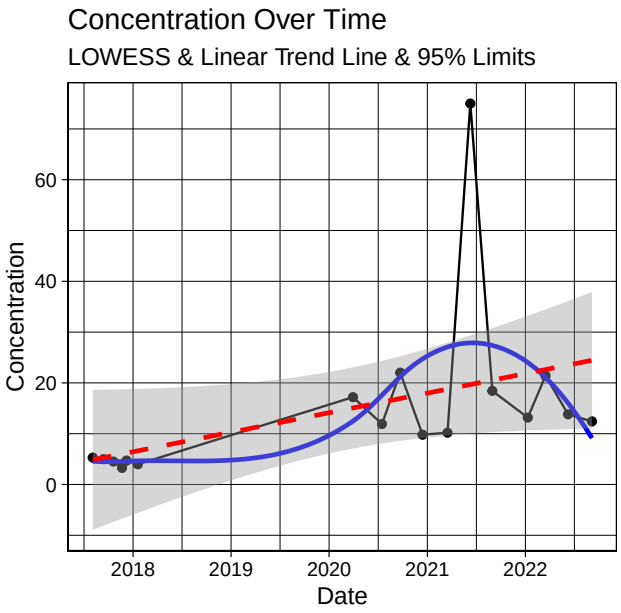
Report for ID : MW255 and Analyte : PFHxSandPFOS

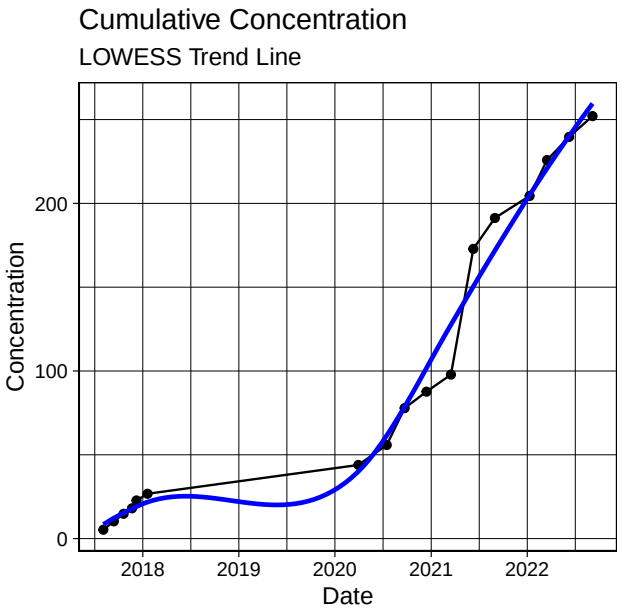




Kendall Trend Test Results Continuous	
n	17
z	2.35
p	0.02
S	58
varS	589.33
tau	0.43
mean	14.83
sd	16.67
cov	1.12
results	INCREASING

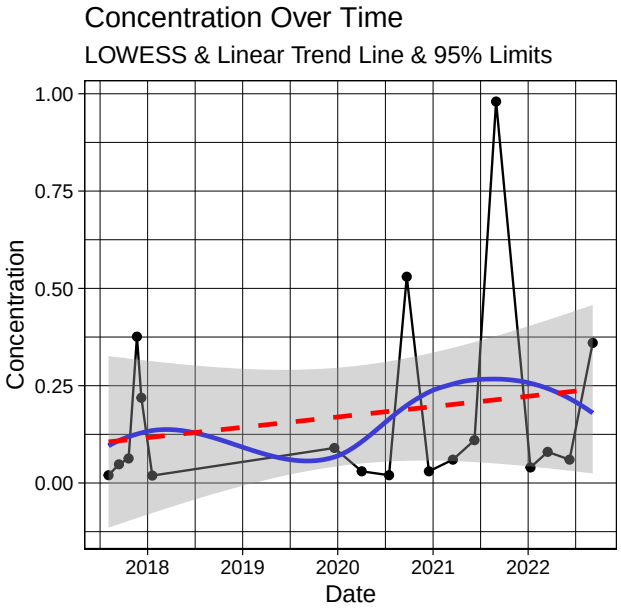
Report for ID : MW256 and Analyte : PFHxSandPFOS

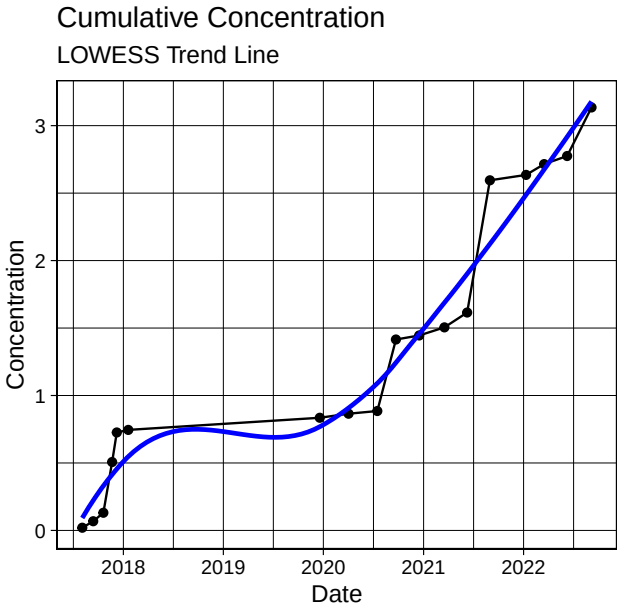




Kendall Trend Test Results Continuous	
n	18
z	1.18
p	0.24
S	32
varS	694
tau	0.21
mean	0.17
sd	0.25
cov	1.43
results	NO CLEAR TREND

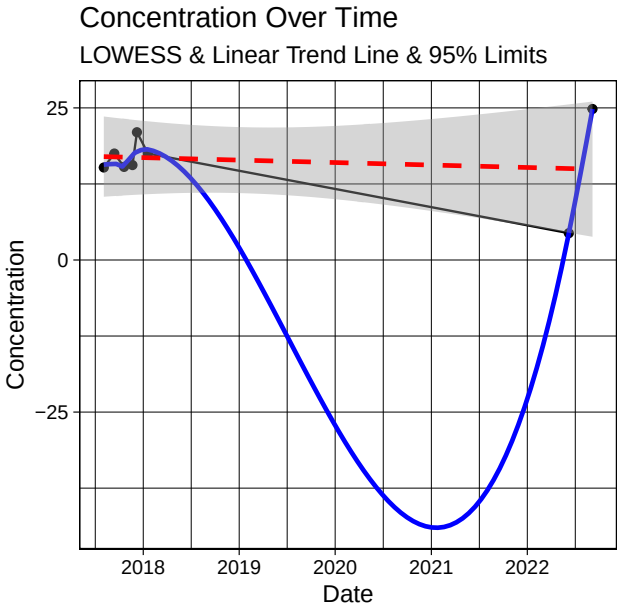
Report for ID : MW257 and Analyte : PFHxSandPFOS

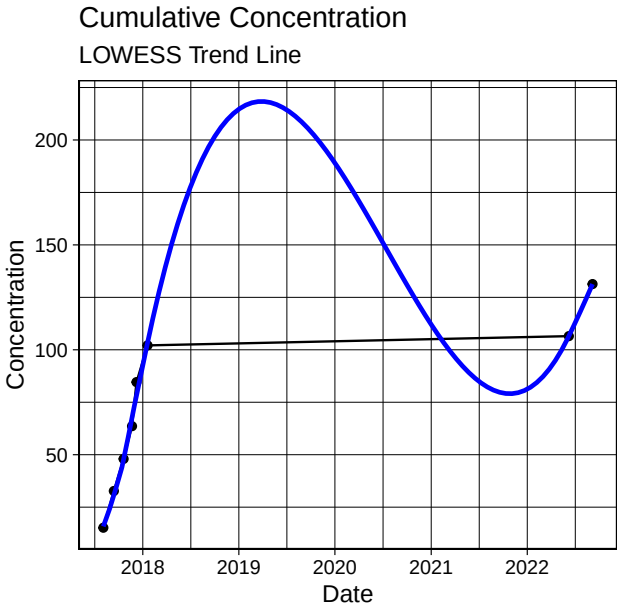




Kendall Trend Test Results Continuous	
n	8
z	1
p	0.32
S	9
varS	64.33
tau	0.33
mean	16.42
sd	5.87
cov	0.36
results	NO CLEAR TREND

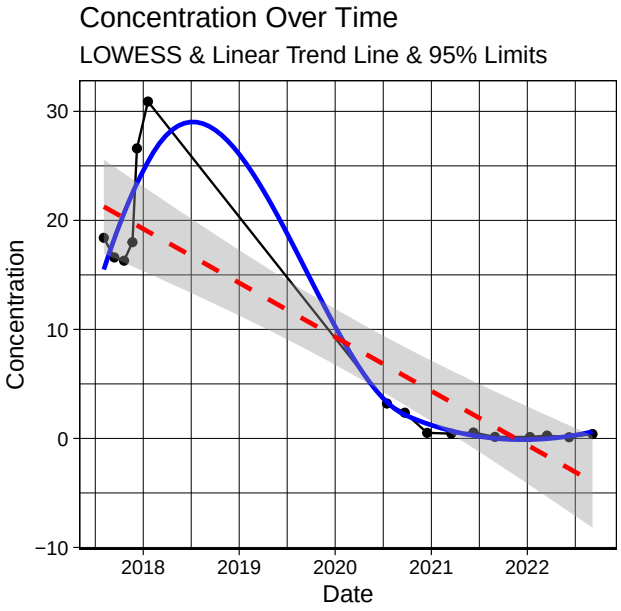
Report for ID : MW258 and Analyte : PFHxSandPFOS

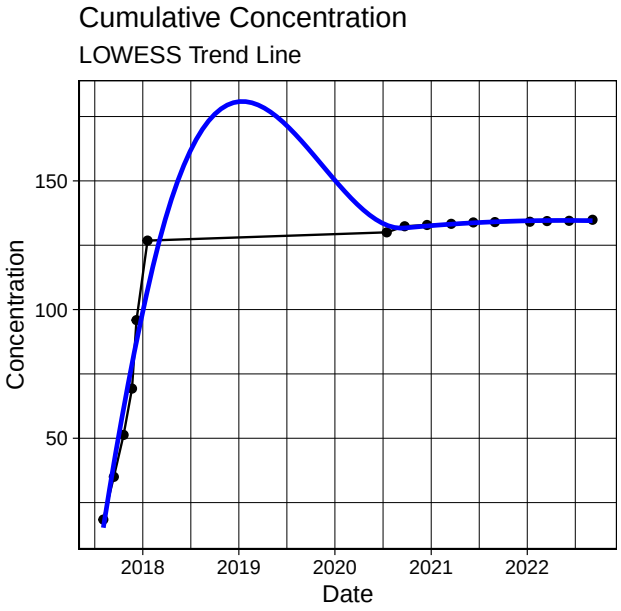




Kendall Trend Test Results Continuous	
n	16
z	-3.65
p	0
S	-82
varS	493.33
tau	-0.68
mean	8.43
sd	10.79
cov	1.28
results	DECREASING

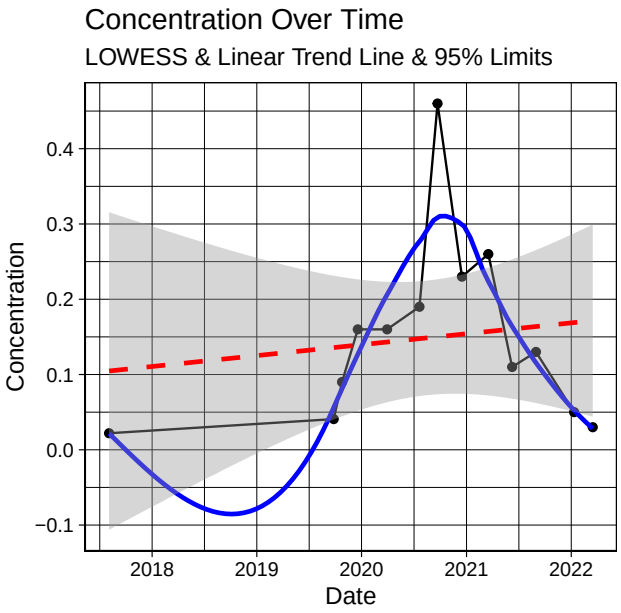
Report for ID : MW259 and Analyte : PFHxSandPFOS

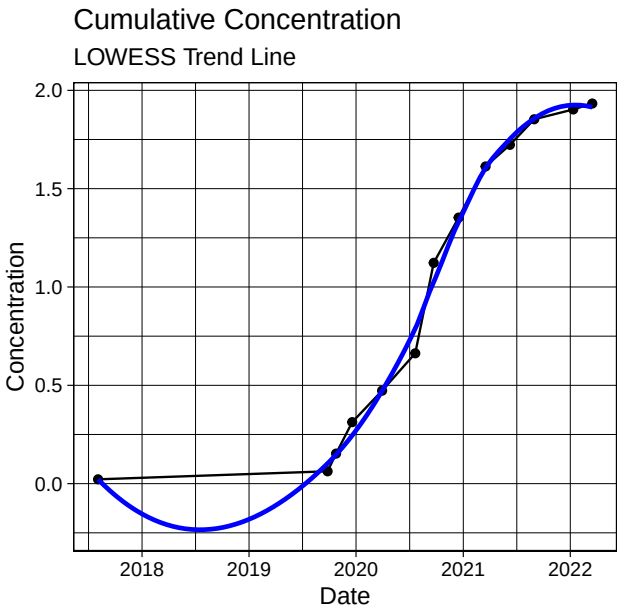




Kendall Trend Test Results Continuous	
n	13
z	0.49
p	0.62
S	9
varS	267.67
tau	0.12
mean	0.15
sd	0.12
cov	0.81
results	NO CLEAR TREND

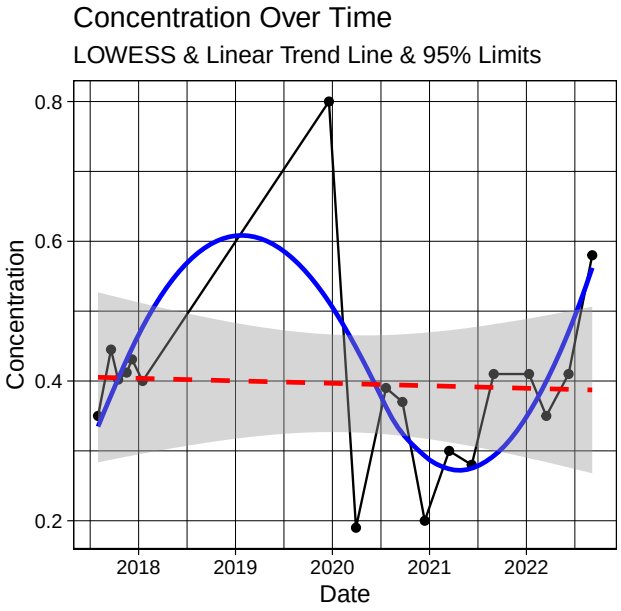
Report for ID : MW261 and Analyte : PFHxSandPFOS

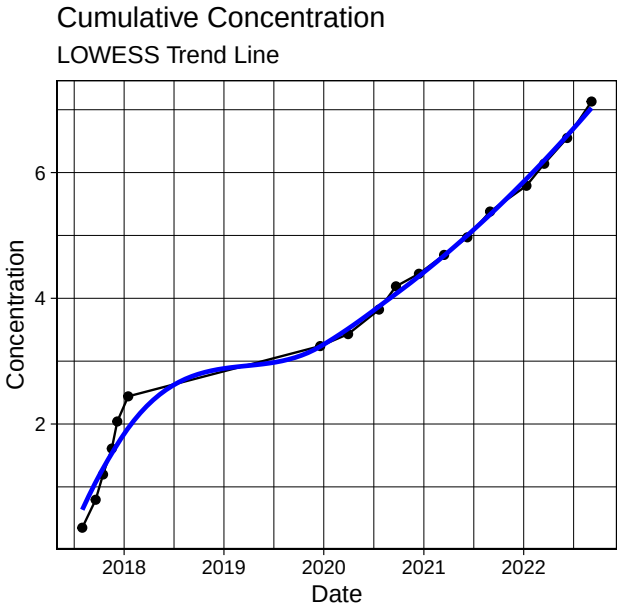




Kendall Trend Test Results Continuous	
n	18
z	-0.23
p	0.82
S	-7
varS	692.33
tau	-0.05
mean	0.4
sd	0.14
cov	0.34
results	STABLE

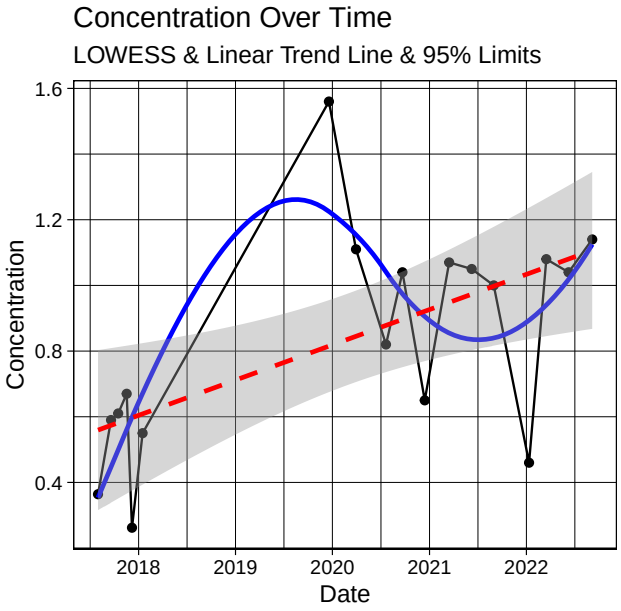
Report for ID : MW268 and Analyte : PFHxSandPFOS

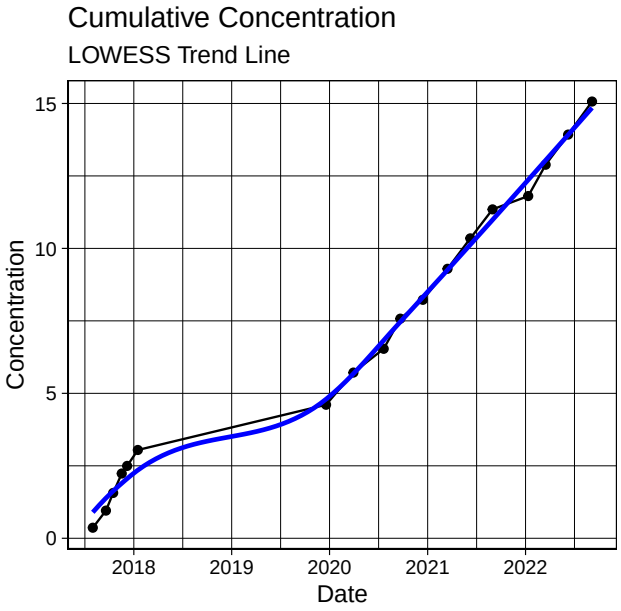




Kendall Trend Test Results Continuous	
n	18
z	2.16
p	0.03
S	58
varS	696
tau	0.38
mean	0.84
sd	0.34
cov	0.4
results	INCREASING

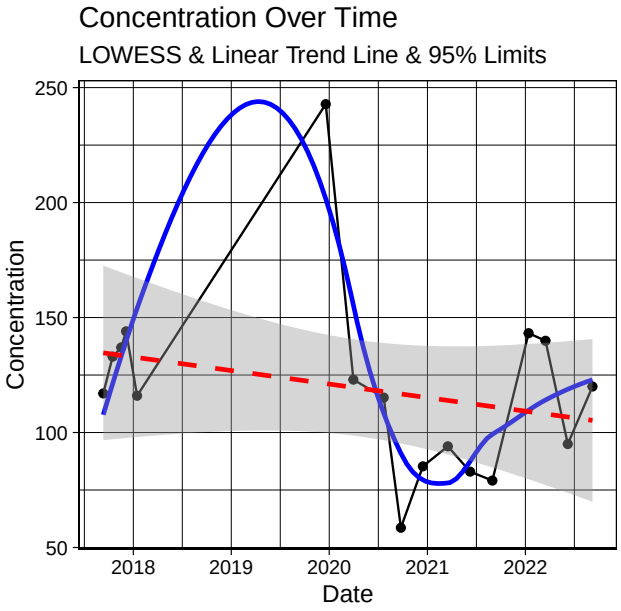
Report for ID : MW269 and Analyte : PFHxSandPFOS

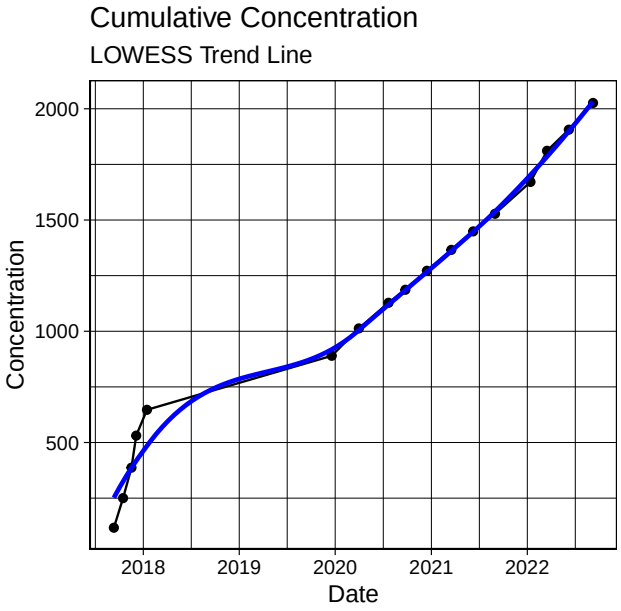




Kendall Trend Test Results Continuous	
n	17
z	-1.11
p	0.27
S	-28
varS	589.33
tau	-0.21
mean	119.18
sd	40.63
cov	0.34
results	STABLE

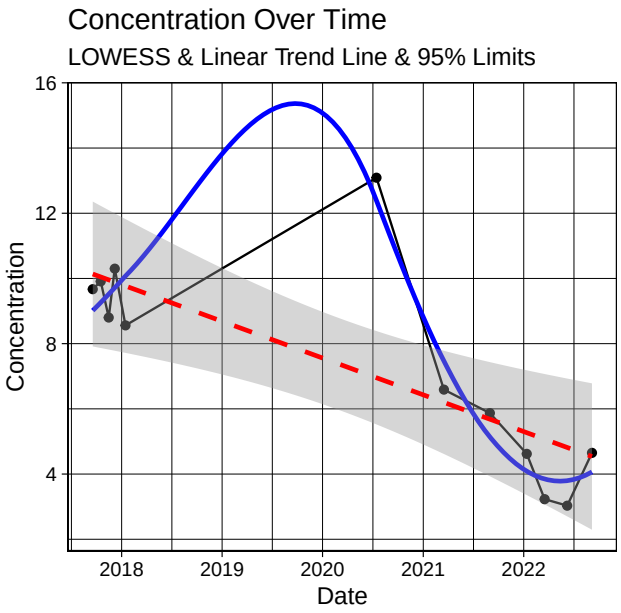
Report for ID : MW282 and Analyte : PFHxSandPFOS

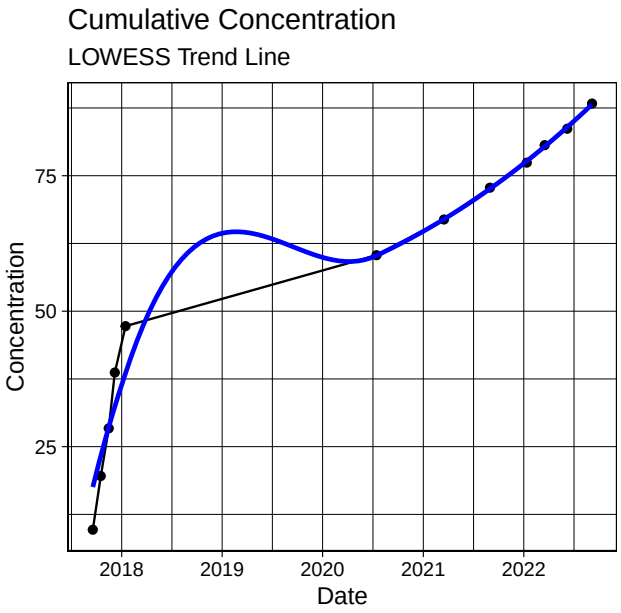




Kendall Trend Test Results Continuous	
n	12
z	-2.81
p	0
S	-42
varS	212.67
tau	-0.64
mean	7.36
sd	3.17
cov	0.43
results	DECREASING

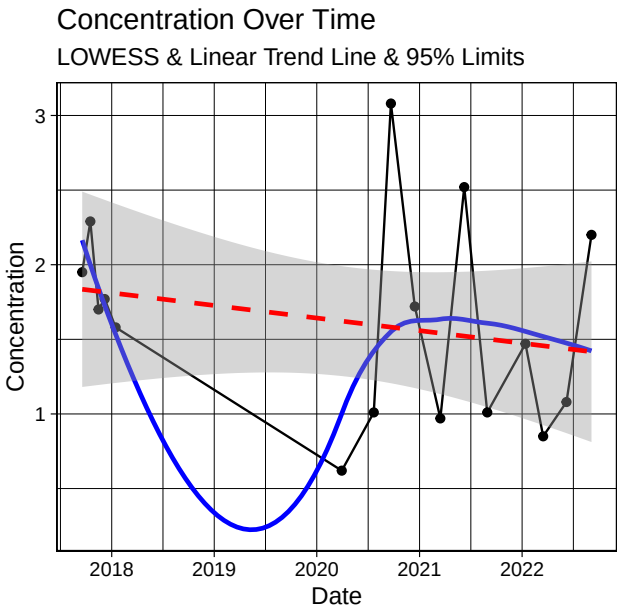
Report for ID : MW288 and Analyte : PFHxSandPFOS

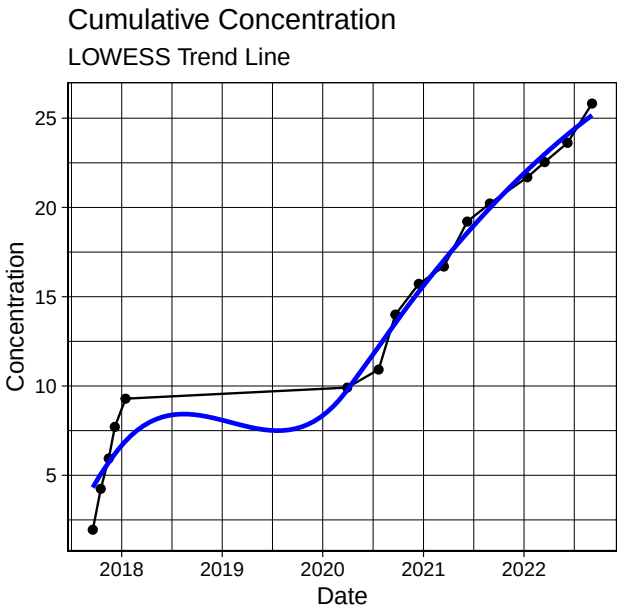




Kendall Trend Test Results Continuous	
n	16
z	-0.99
p	0.32
S	-23
varS	492.33
tau	-0.19
mean	1.61
sd	0.68
cov	0.42
results	STABLE

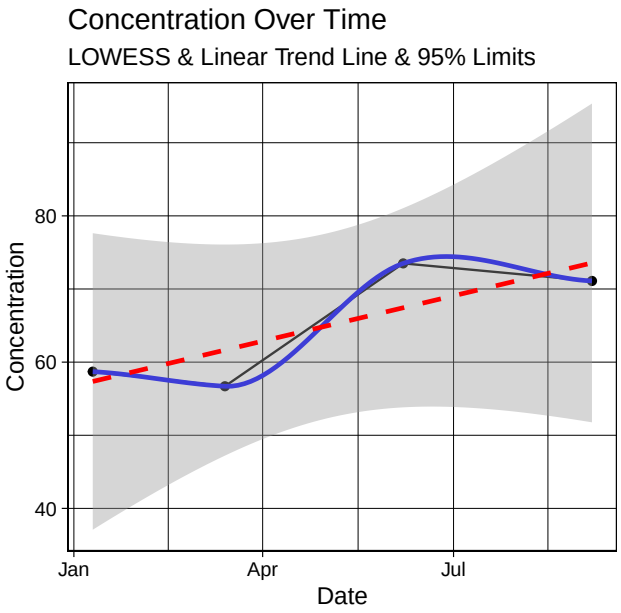
Report for ID : MW289 and Analyte : PFHxSandPFOS

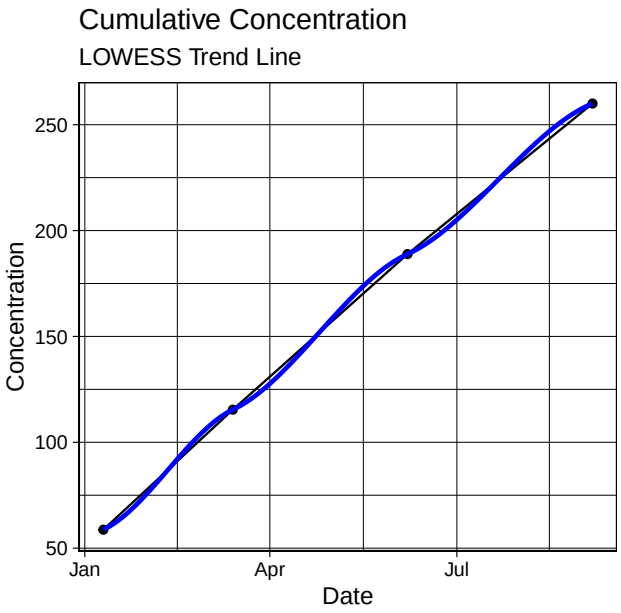




Kendall Trend Test Results Continuous	
n	4
z	0.34
p	0.73
S	2
varS	8.67
tau	0.33
mean	65
sd	8.53
cov	0.13
results	NO CLEAR TREND

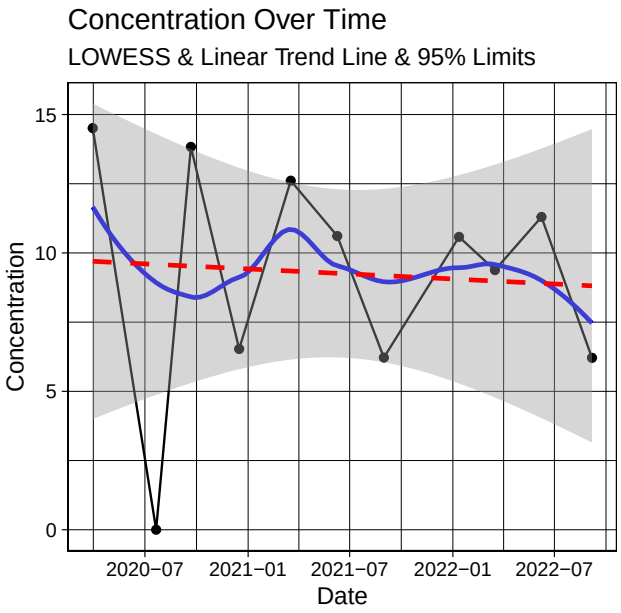
Report for ID : MW500 and Analyte : PFHxSandPFOS

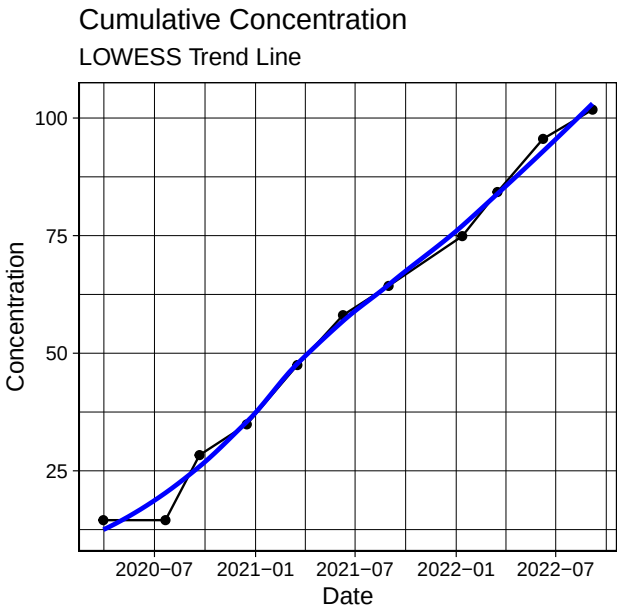




Kendall Trend Test Results Continuous	
n	11
z	-1.09
p	0.28
S	-15
varS	165
tau	-0.27
mean	9.25
sd	4.23
cov	0.46
results	STABLE

Report for ID : MW516 and Analyte : PFHxSandPFOS





Trend Report

Report Date & Time: 2023-03-02 00:46:29

Data File Name: inputPFOA2022.csv

Report Title: PFOA Trend in Groundwater

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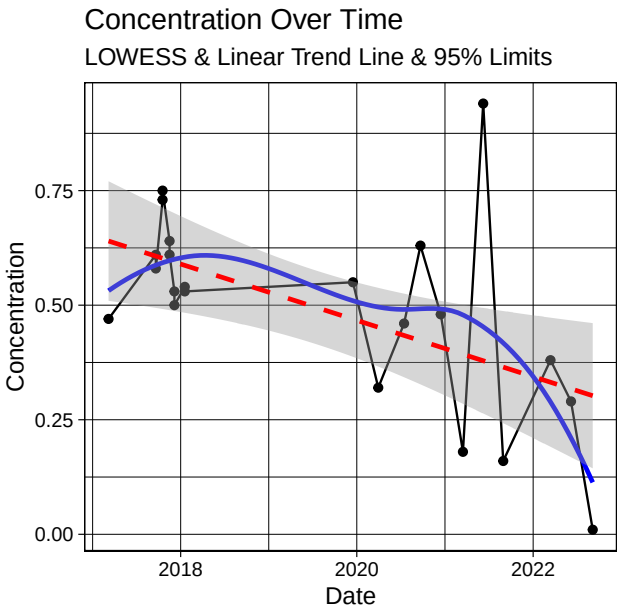
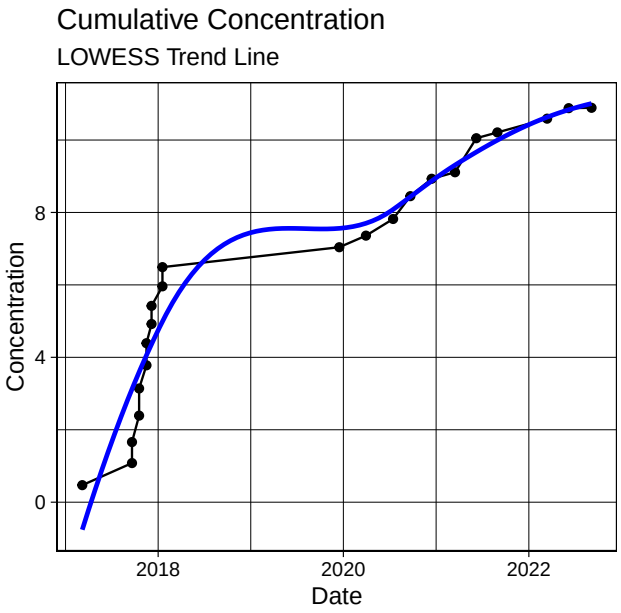
Kendall Trend Test Results Continuous	
n	22
z	-2.88
p	0
S	-103
varS	1255.67
tau	-0.45
mean	0.5
sd	0.21
cov	0.43
results	DECREASING

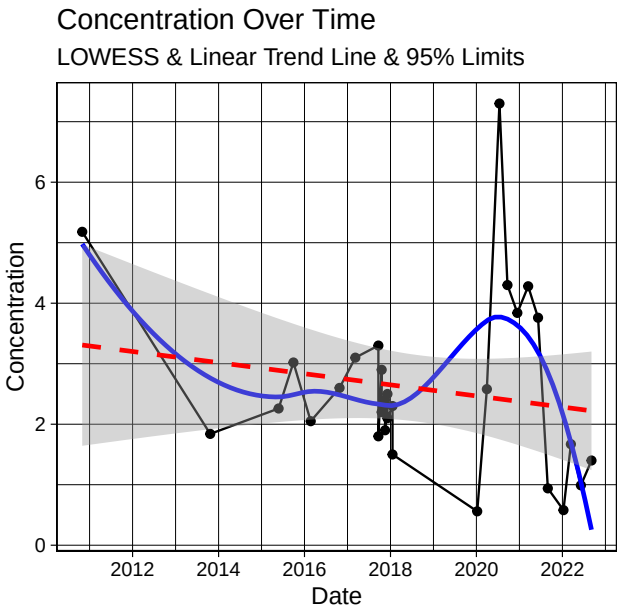
Report for ID : MW109 and Analyte : PFOA

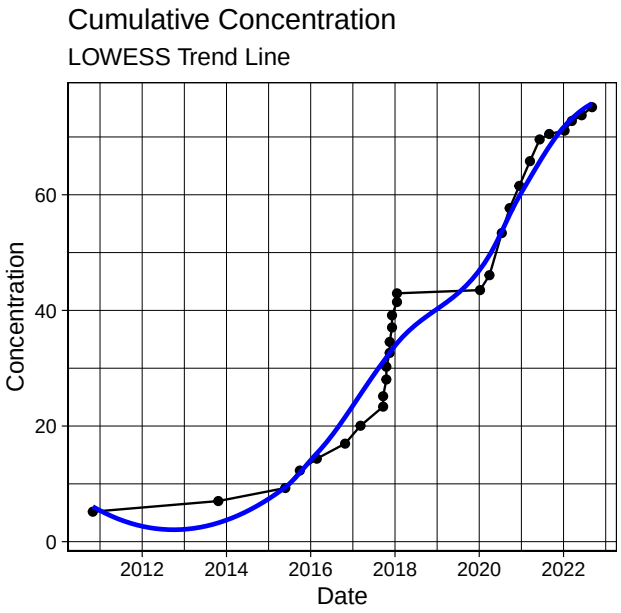




Kendall Trend Test Results Continuous	
n	29
z	-1.29
p	0.2
S	-70
varS	2842
tau	-0.17
mean	2.59
sd	1.44
cov	0.56
results	STABLE

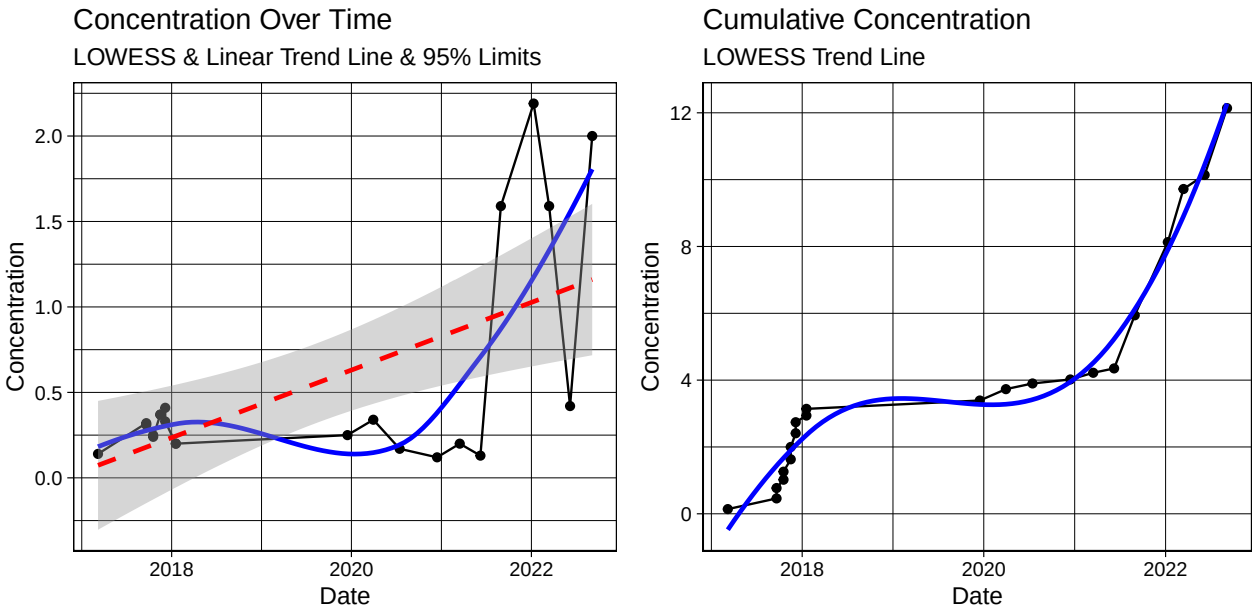
Report for ID : MW112 and Analyte : PFOA





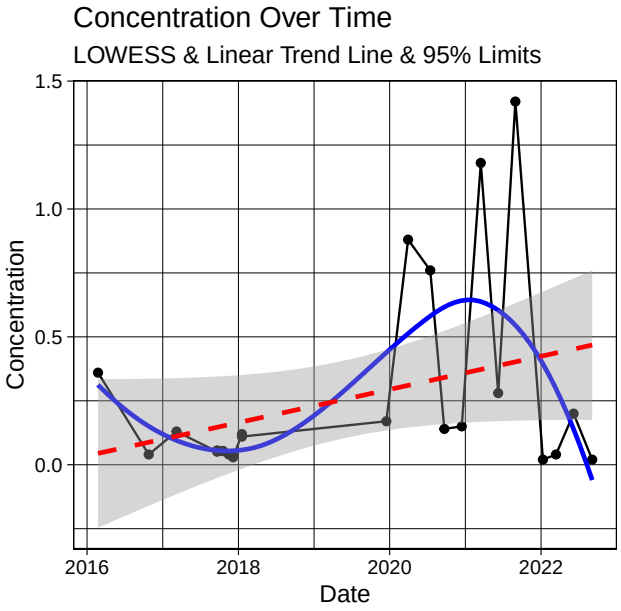
Kendall Trend Test Results Continuous	
n	22
z	1.24
p	0.21
S	45
varS	1251
tau	0.2
mean	0.55
sd	0.64
cov	1.16
results	NO CLEAR TREND

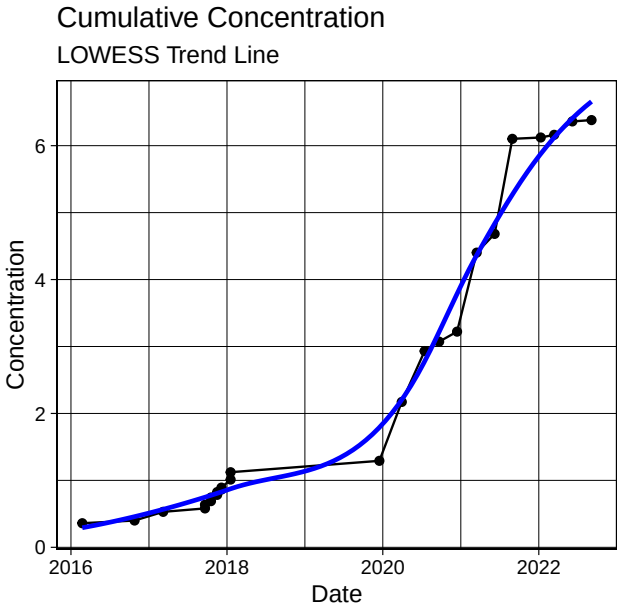
Report for ID : MW120 and Analyte : PFOA



Kendall Trend Test Results Continuous	
n	25
z	0.87
p	0.39
S	38
varS	1828.67
tau	0.13
mean	0.26
sd	0.38
cov	1.5
results	NO CLEAR TREND

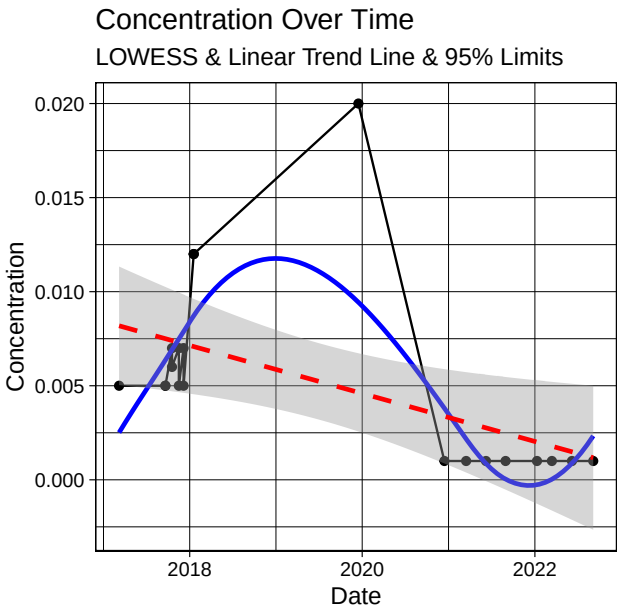
Report for ID : MW121 and Analyte : PFOA

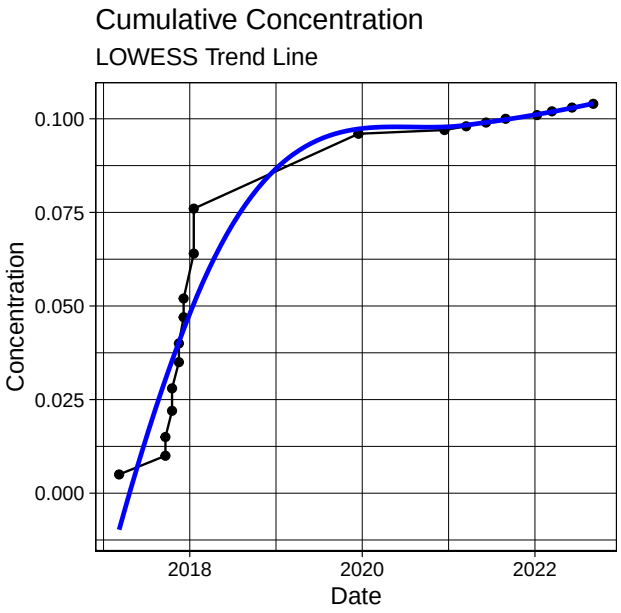




Kendall Trend Test Results Continuous	
n	20
z	-2.01
p	0.04
S	-60
varS	863.33
tau	-0.36
mean	0.01
sd	0
cov	0.95
results	DECREASING

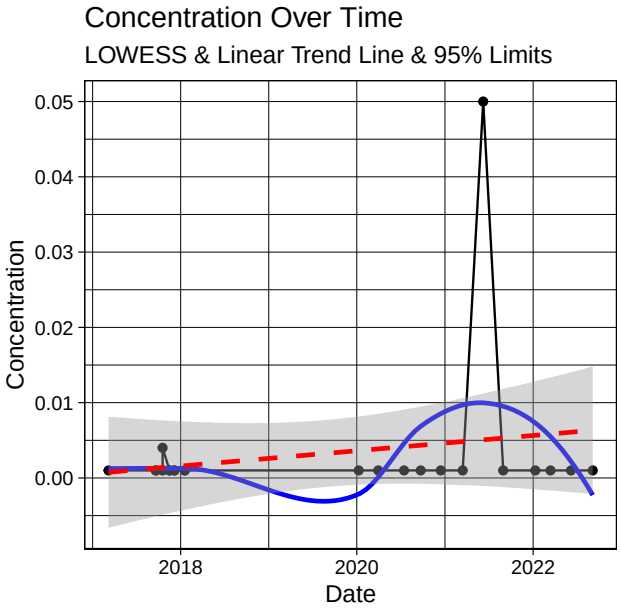
Report for ID : MW123 and Analyte : PFOA

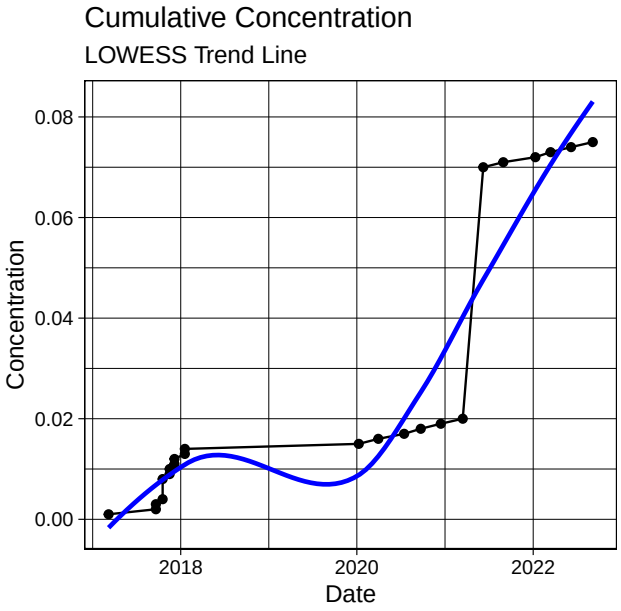




Kendall Trend Test Results Continuous	
n	23
z	0
p	1
S	-1
varS	337
tau	-0.01
mean	0
sd	0.01
cov	3.13
results	NO CLEAR TREND

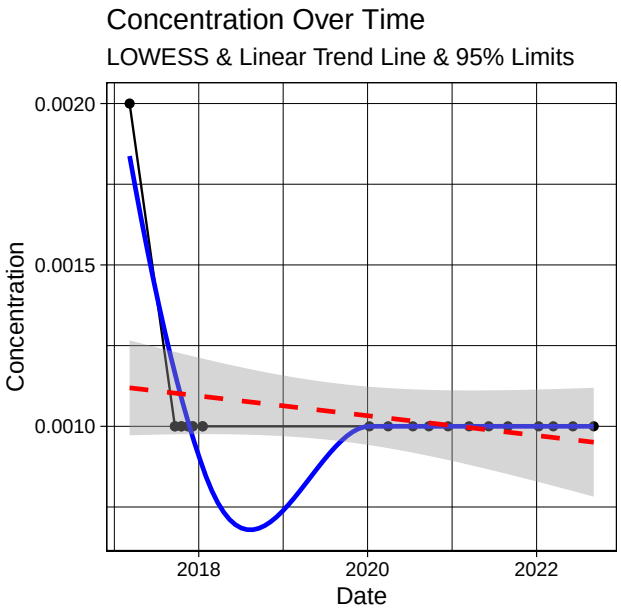
Report for ID : MW124 and Analyte : PFOA

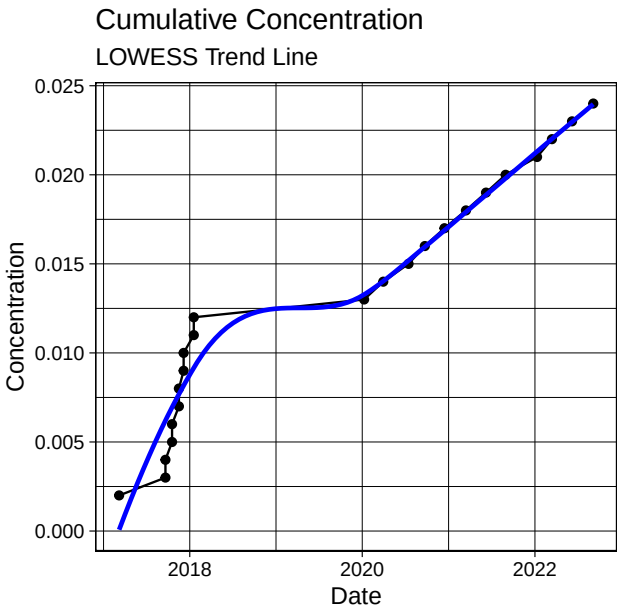




Kendall Trend Test Results Continuous	
n	23
z	-1.58
p	0.11
S	-22
varS	176
tau	-0.29
mean	0
sd	0
cov	0.2
results	STABLE

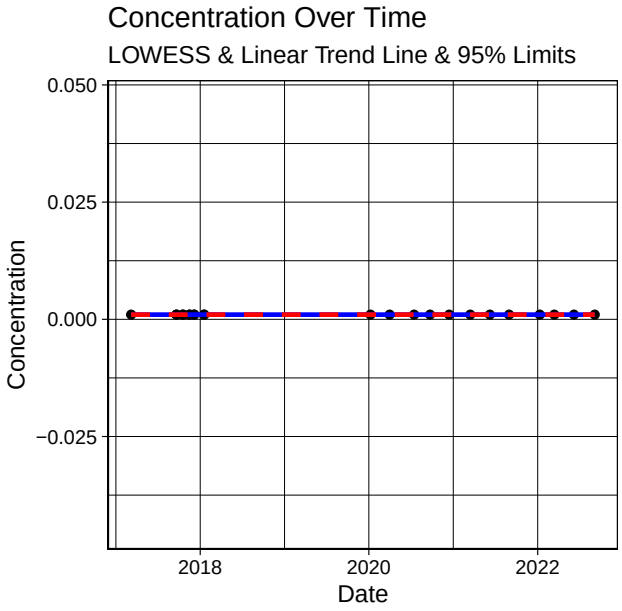
Report for ID : MW125 and Analyte : PFOA

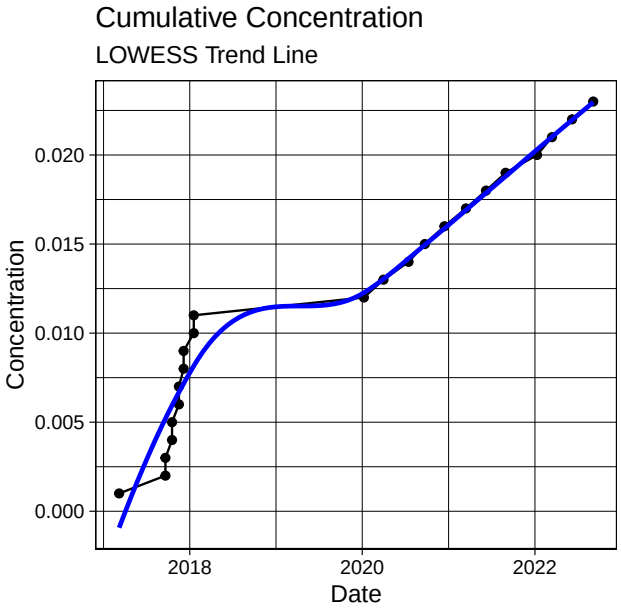




Kendall Trend Test Results Continuous	
n	23
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

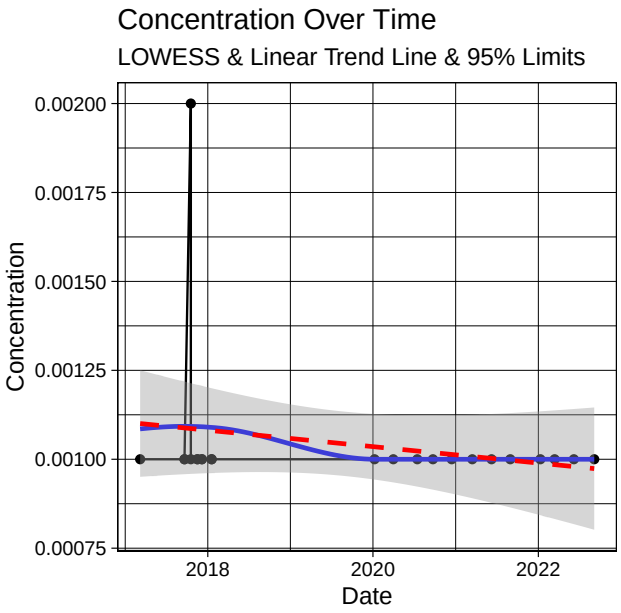
Report for ID : MW126 and Analyte : PFOA

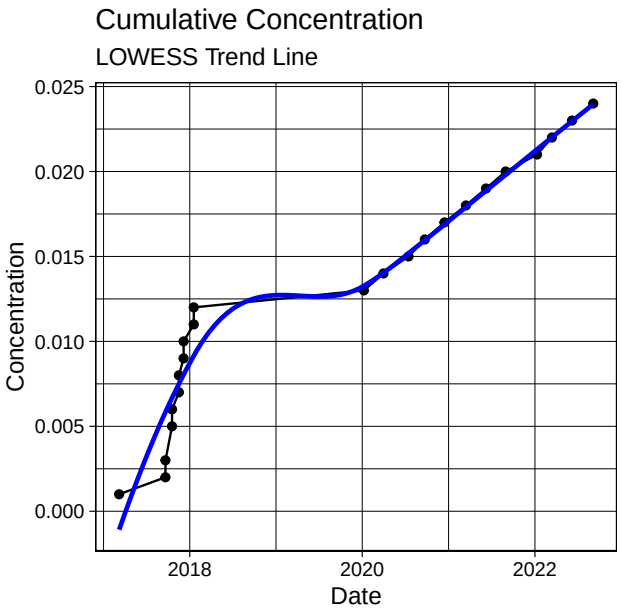




Kendall Trend Test Results Continuous	
n	23
z	-1.13
p	0.26
S	-16
varS	176
tau	-0.21
mean	0
sd	0
cov	0.2
results	STABLE

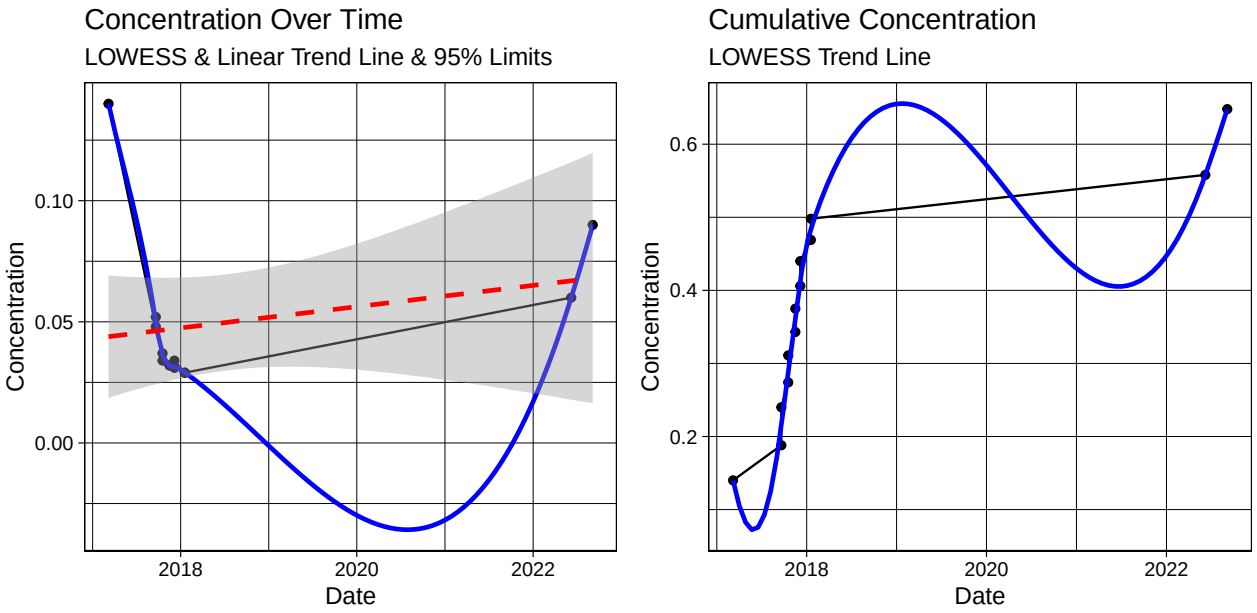
Report for ID : MW127 and Analyte : PFOA





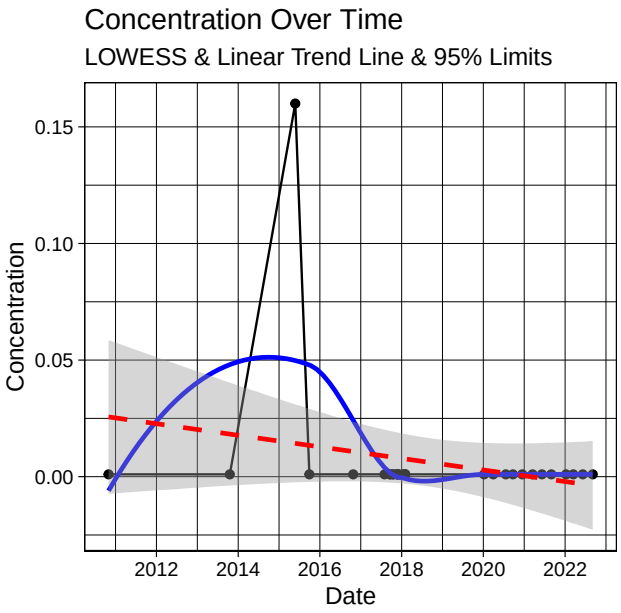
Kendall Trend Test Results Continuous	
n	13
z	-1.35
p	0.18
S	-23
varS	265.67
tau	-0.3
mean	0.05
sd	0.03
cov	0.64
results	STABLE

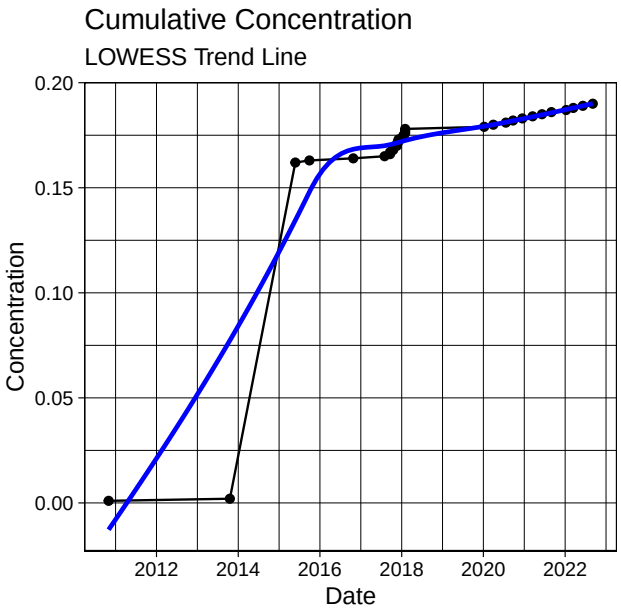
Report for ID : MW128 and Analyte : PFOA



Kendall Trend Test Results Continuous	
n	31
z	-1.4
p	0.16
S	-26
varS	320
tau	-0.22
mean	0.01
sd	0.03
cov	4.66
results	NO CLEAR TREND

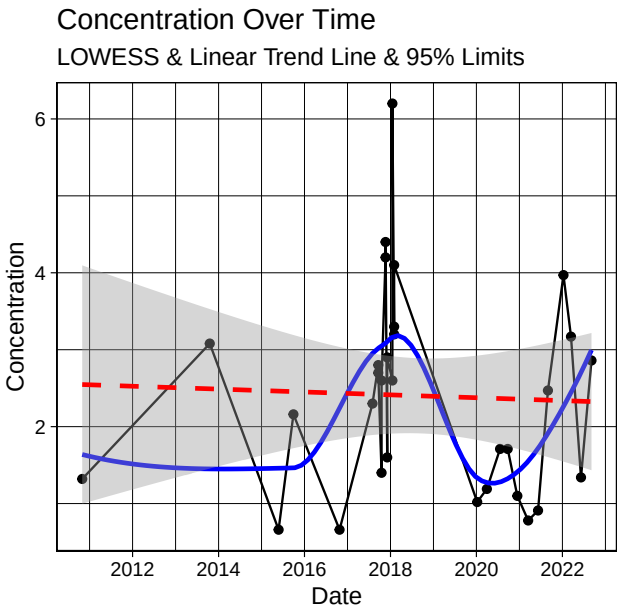
Report for ID : MW139 and Analyte : PFOA

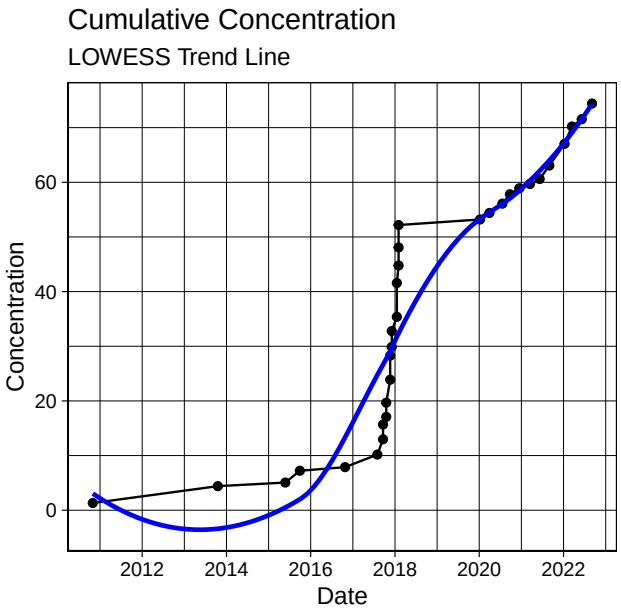




Kendall Trend Test Results Continuous	
n	31
z	0.22
p	0.83
S	14
varS	3458.67
tau	0.03
mean	2.4
sd	1.31
cov	0.54
results	NO CLEAR TREND

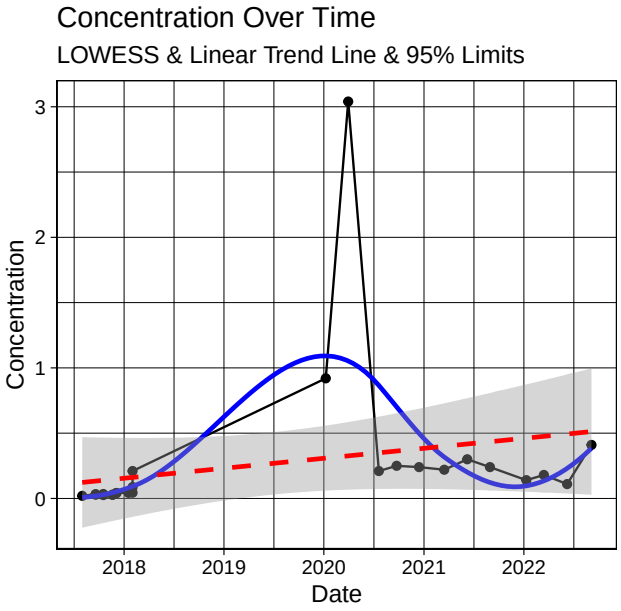
Report for ID : MW141 and Analyte : PFOA

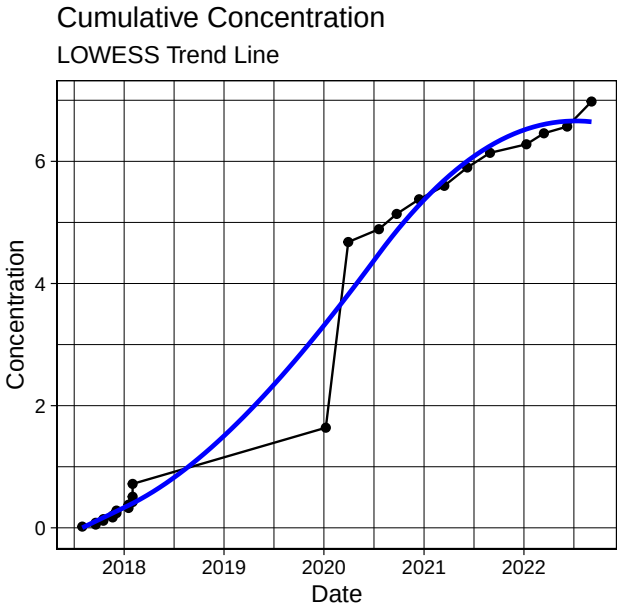




Kendall Trend Test Results Continuous	
n	26
z	4.52
p	0
S	206
varS	2055.33
tau	0.64
mean	0.27
sd	0.6
cov	2.22
results	INCREASING

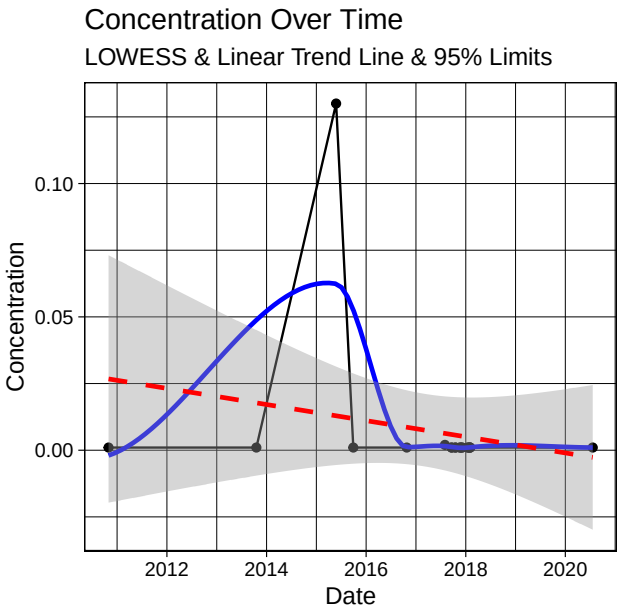
Report for ID : MW142 and Analyte : PFOA

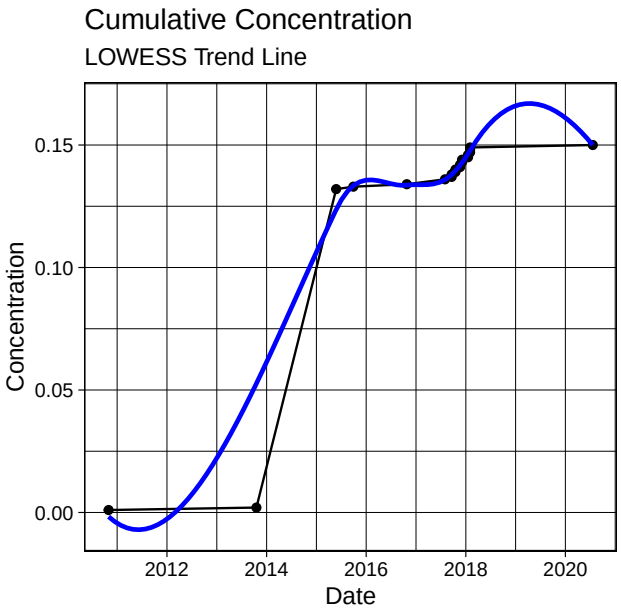




Kendall Trend Test Results Continuous	
n	20
z	-1.51
p	0.13
S	-25
varS	253
tau	-0.3
mean	0.01
sd	0.03
cov	3.84
results	NO CLEAR TREND

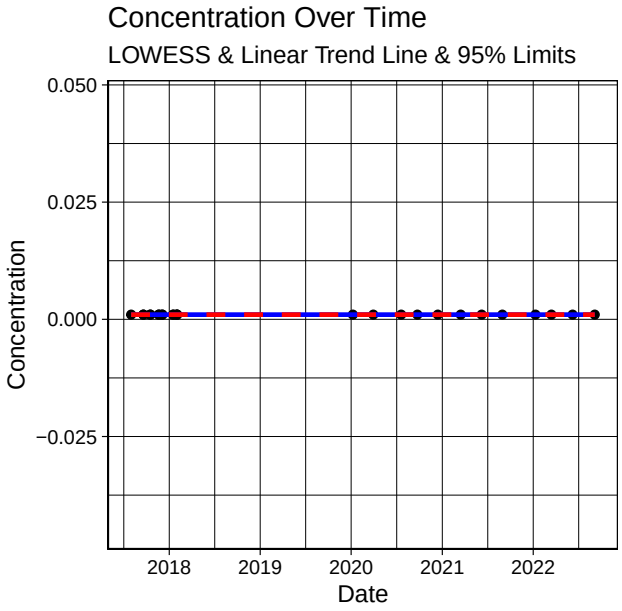
Report for ID : MW147 and Analyte : PFOA

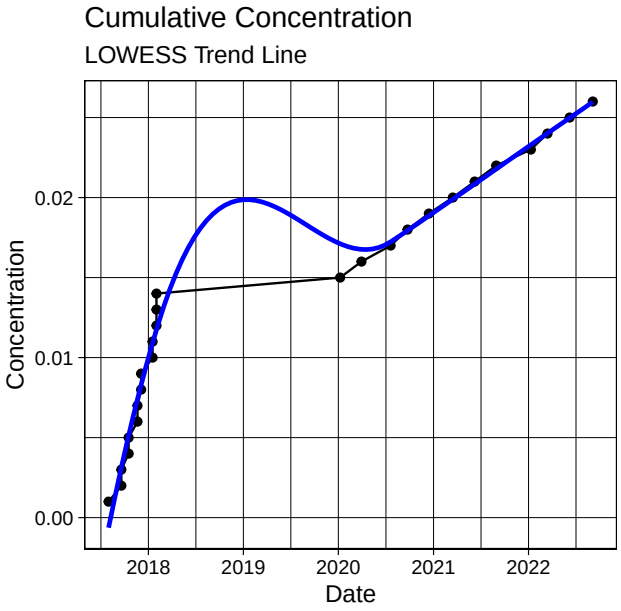




Kendall Trend Test Results Continuous	
n	26
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

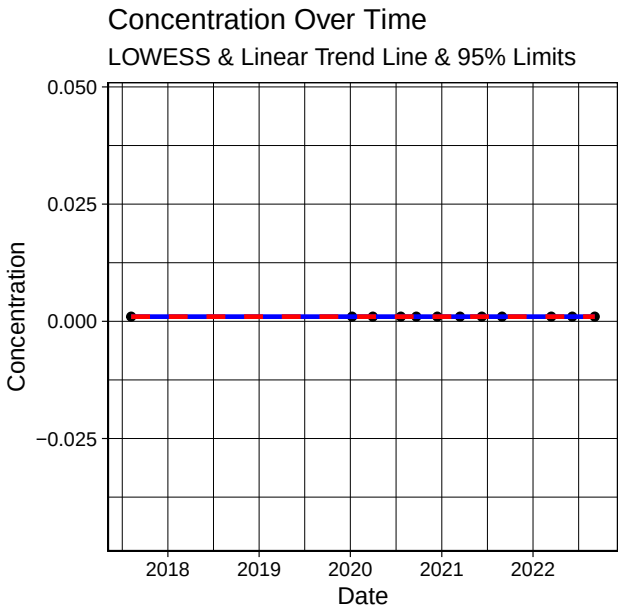
Report for ID : MW149 and Analyte : PFOA

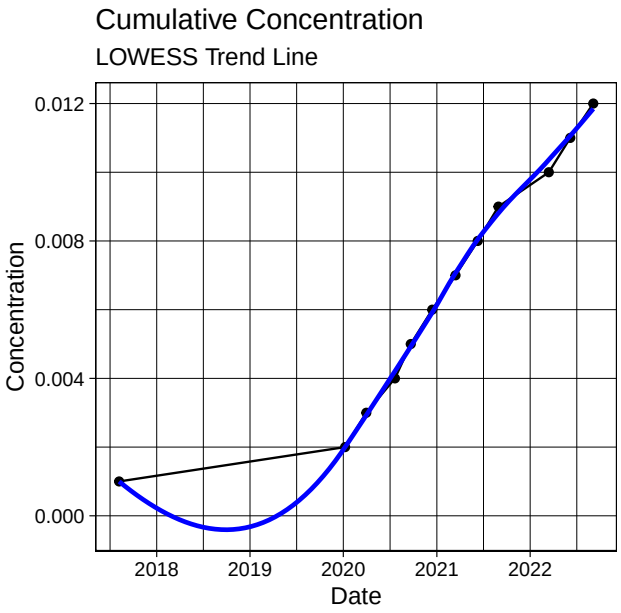




Kendall Trend Test Results Continuous	
n	12
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

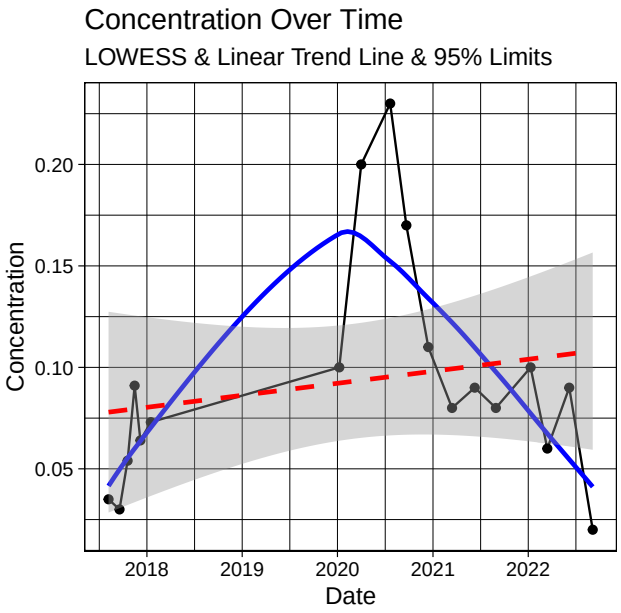
Report for ID : MW158 and Analyte : PFOA

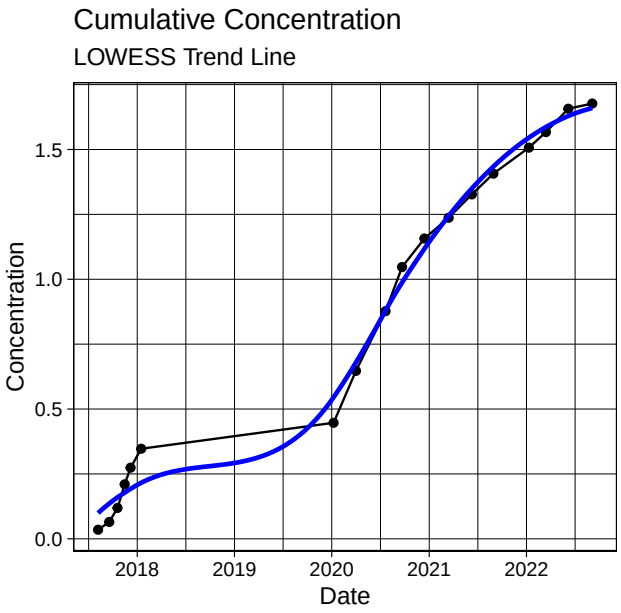




Kendall Trend Test Results Continuous	
n	18
z	0.57
p	0.57
S	16
varS	694
tau	0.11
mean	0.09
sd	0.06
cov	0.6
results	NO CLEAR TREND

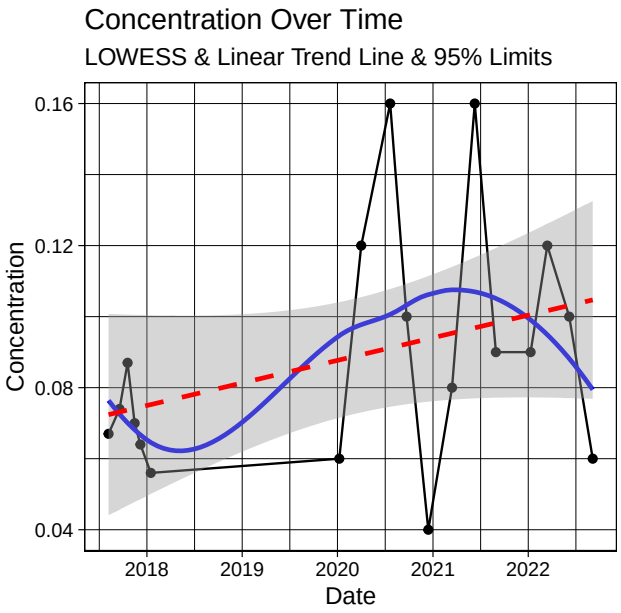
Report for ID : MW161 and Analyte : PFOA

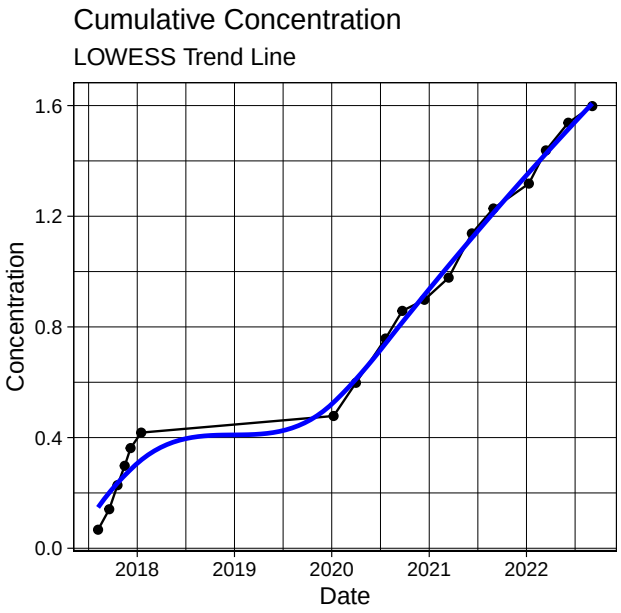




Kendall Trend Test Results Continuous	
n	18
z	1.03
p	0.3
S	28
varS	692
tau	0.19
mean	0.09
sd	0.03
cov	0.38
results	NO CLEAR TREND

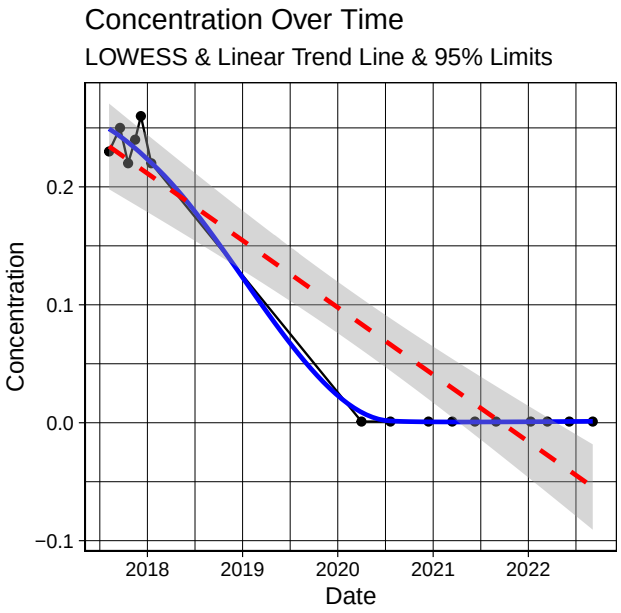
Report for ID : MW166 and Analyte : PFOA

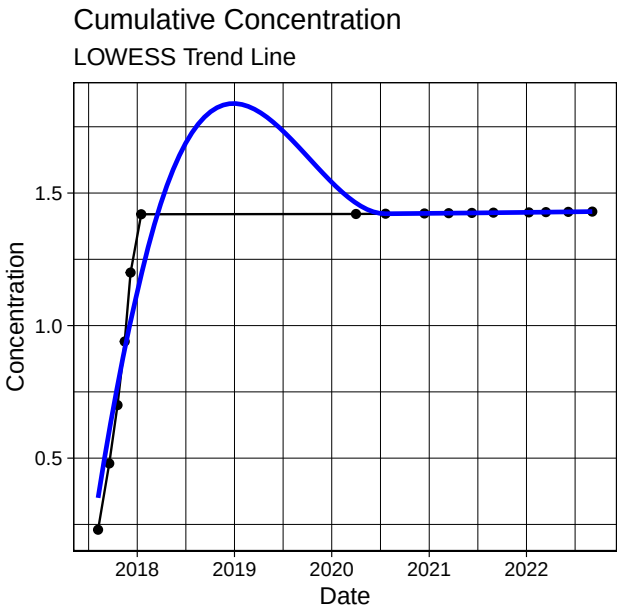




Kendall Trend Test Results Continuous	
n	16
z	-3.08
p	0
S	-60
varS	367.33
tau	-0.64
mean	0.09
sd	0.12
cov	1.32
results	DECREASING

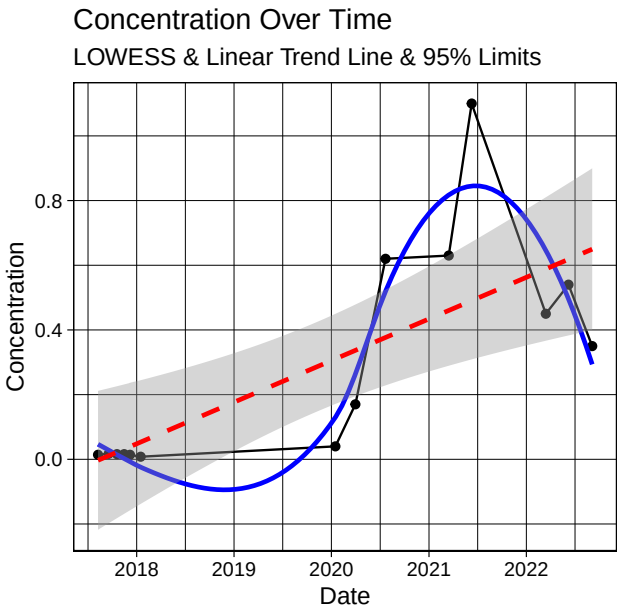
Report for ID : MW171 and Analyte : PFOA

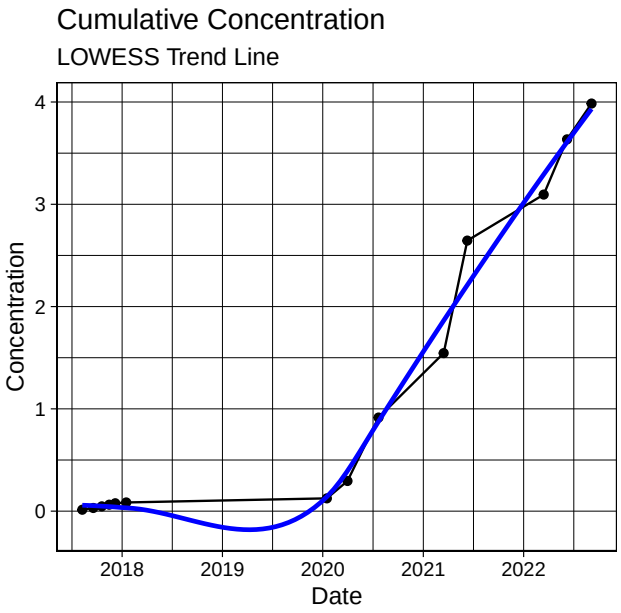




Kendall Trend Test Results Continuous	
n	14
z	2.53
p	0.01
S	47
varS	331.67
tau	0.52
mean	0.28
sd	0.34
cov	1.2
results	INCREASING

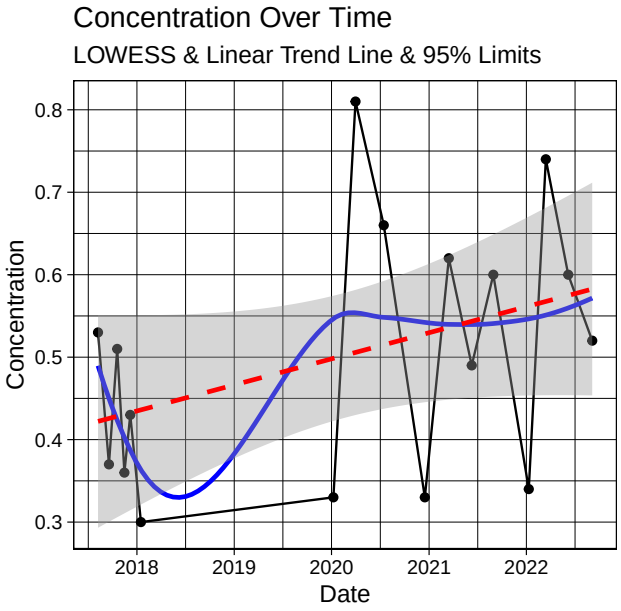
Report for ID : MW173 and Analyte : PFOA

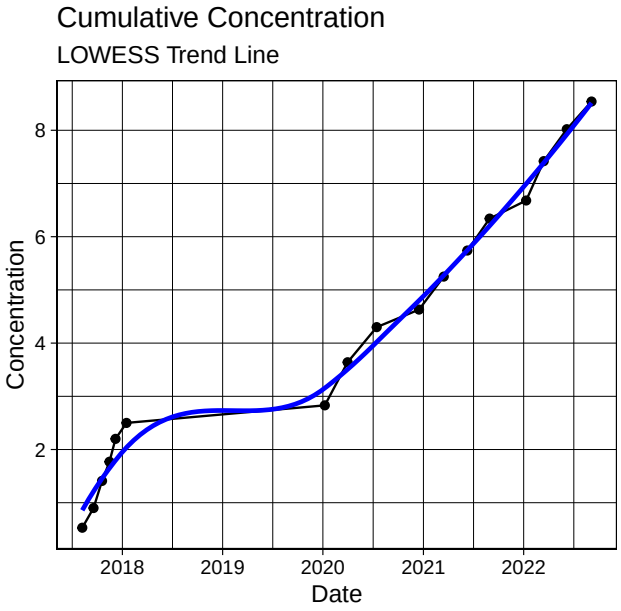




Kendall Trend Test Results Continuous	
n	17
z	0.78
p	0.43
S	20
varS	587.33
tau	0.15
mean	0.5
sd	0.15
cov	0.31
results	NO CLEAR TREND

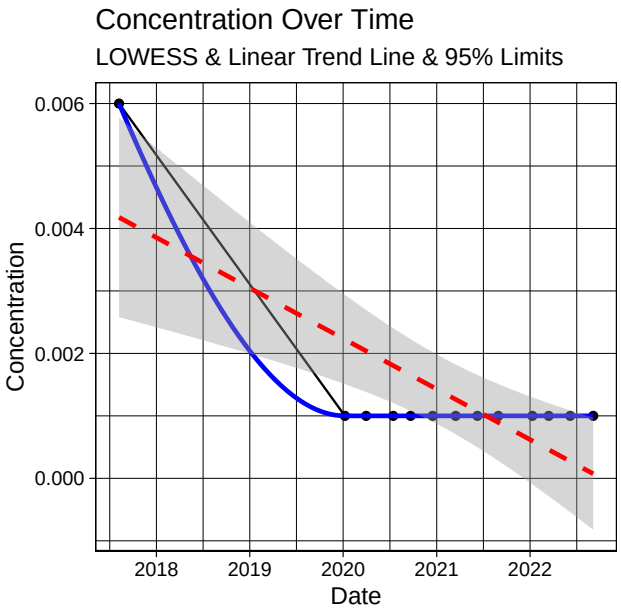
Report for ID : MW193 and Analyte : PFOA

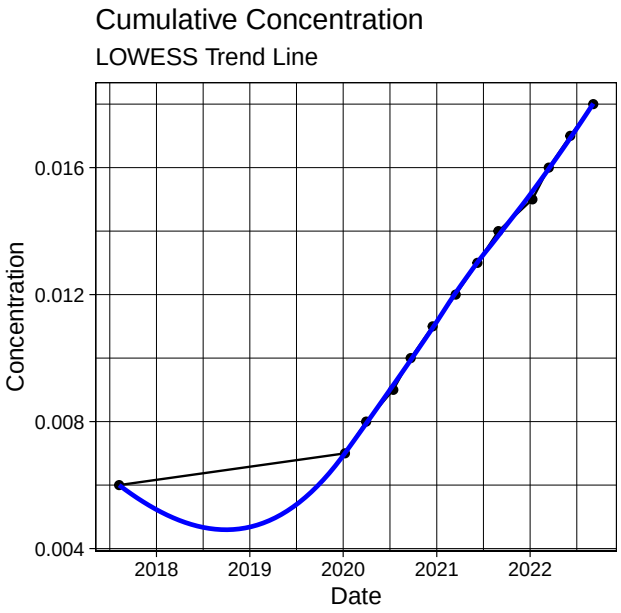




Kendall Trend Test Results Continuous	
n	13
z	-1.47
p	0.14
S	-12
varS	56
tau	-0.39
mean	0
sd	0
cov	1
results	NO CLEAR TREND

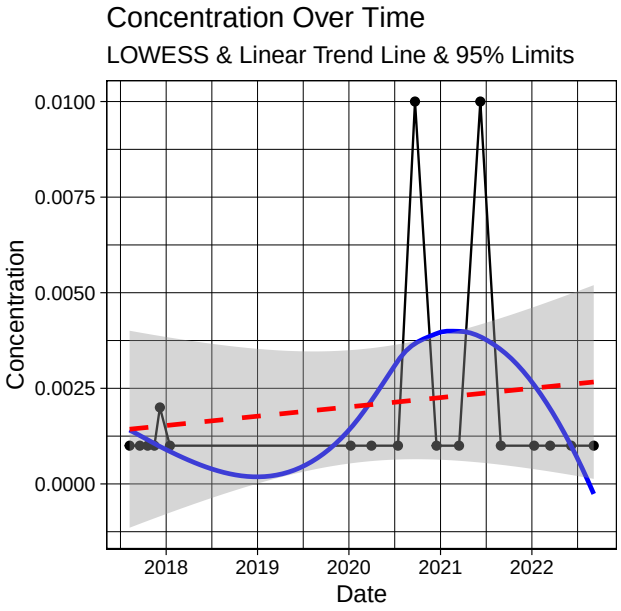
Report for ID : MW195D and Analyte : PFOA

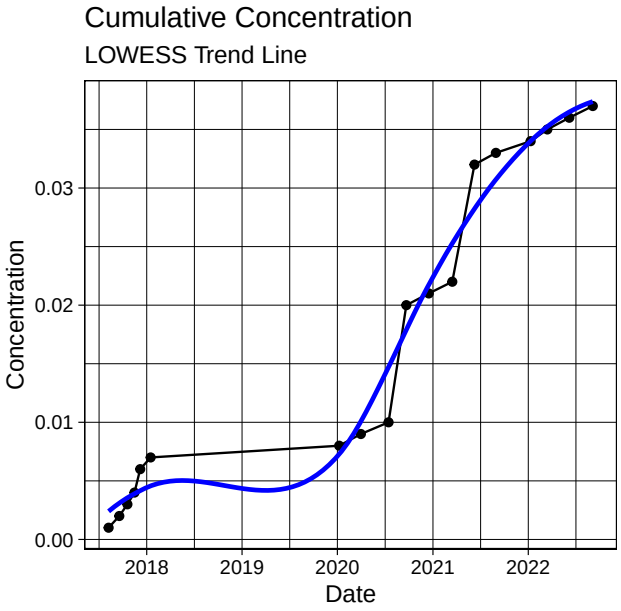




Kendall Trend Test Results Continuous	
n	18
z	0
p	1
S	1
varS	287.67
tau	0.01
mean	0
sd	0
cov	1.41
results	NO CLEAR TREND

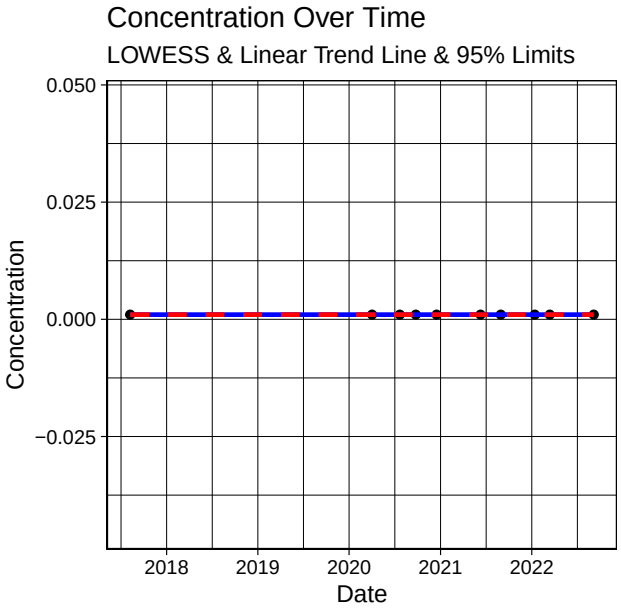
Report for ID : MW195S and Analyte : PFOA

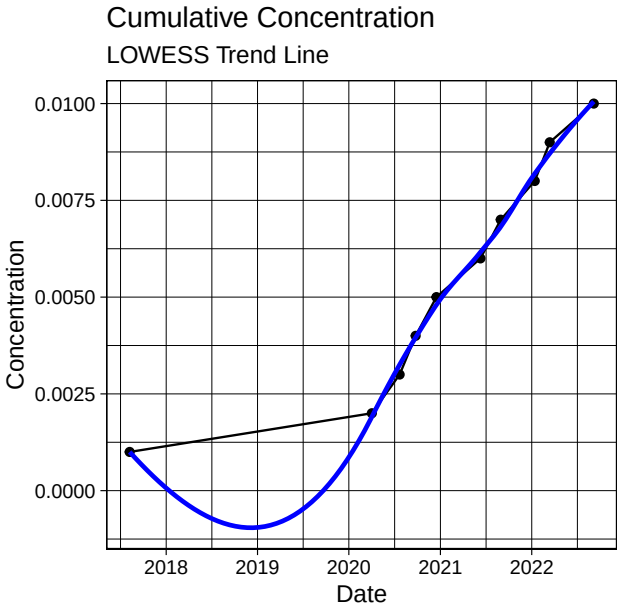




Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

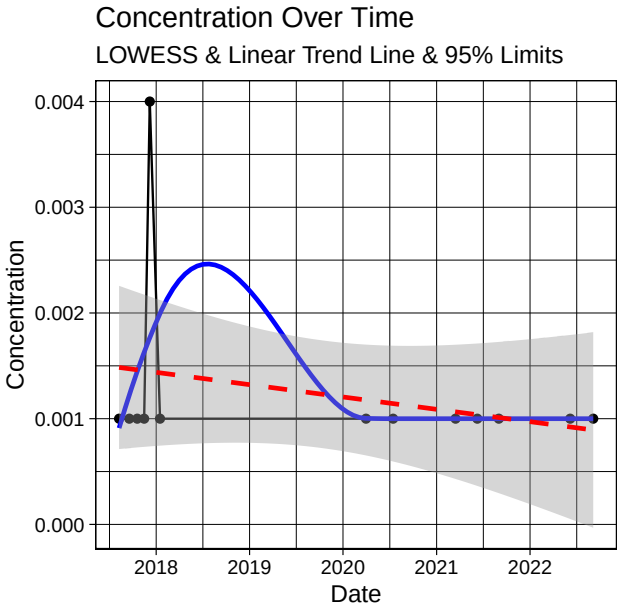
Report for ID : MW196 and Analyte : PFOA

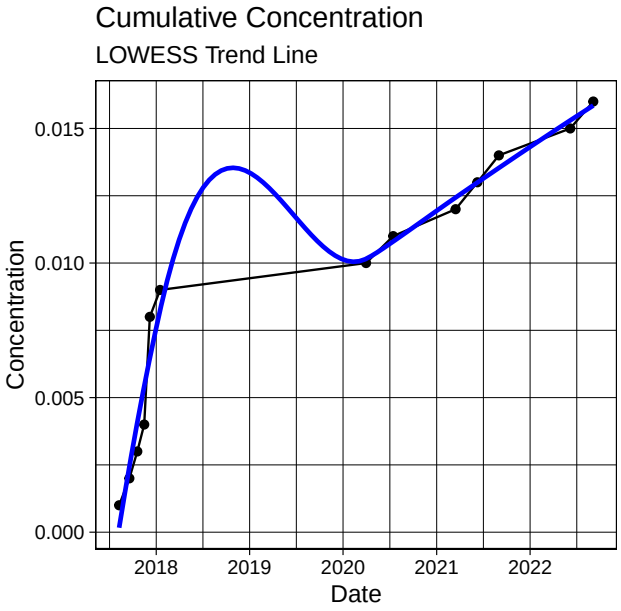




Kendall Trend Test Results Continuous	
n	13
z	-0.4
p	0.69
S	-4
varS	56
tau	-0.13
mean	0
sd	0
cov	0.68
results	STABLE

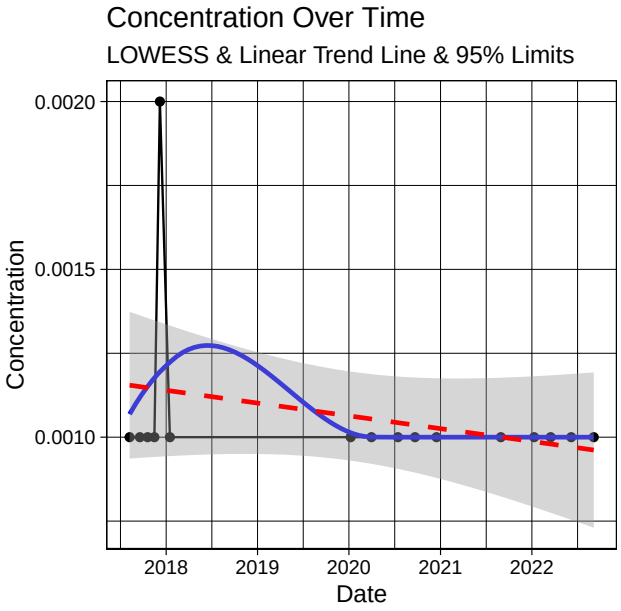
Report for ID : MW197 and Analyte : PFOA

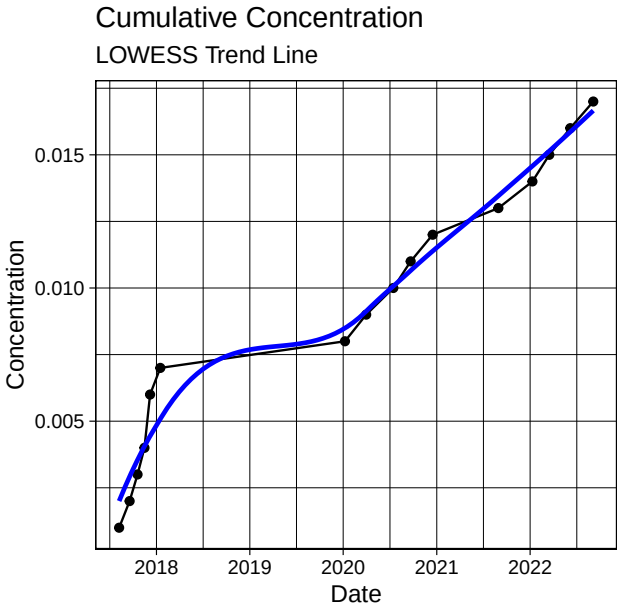




Kendall Trend Test Results Continuous	
n	16
z	-0.65
p	0.52
S	-7
varS	85
tau	-0.16
mean	0
sd	0
cov	0.24
results	STABLE

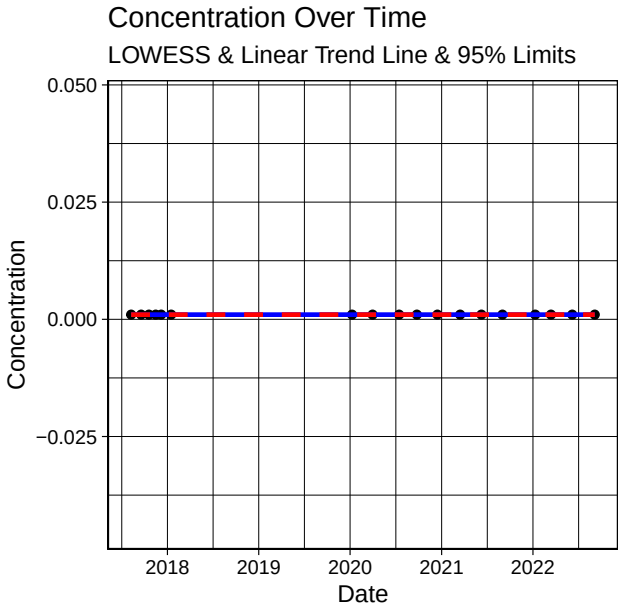
Report for ID : MW199 and Analyte : PFOA

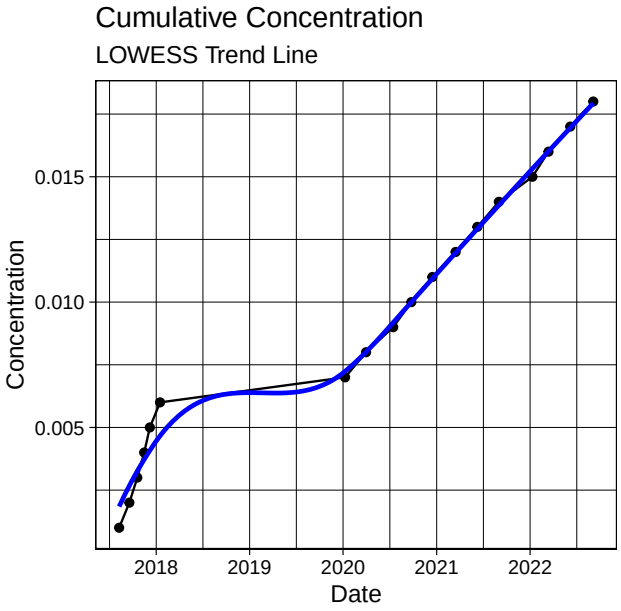




Kendall Trend Test Results Continuous	
n	18
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

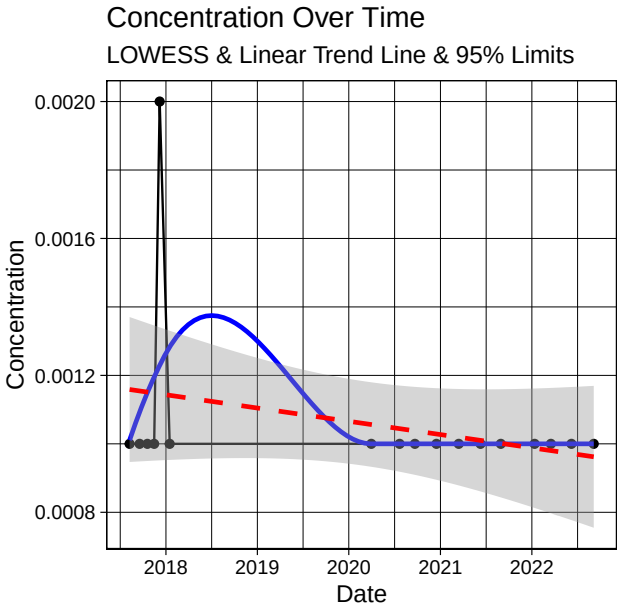
Report for ID : MW200 and Analyte : PFOA

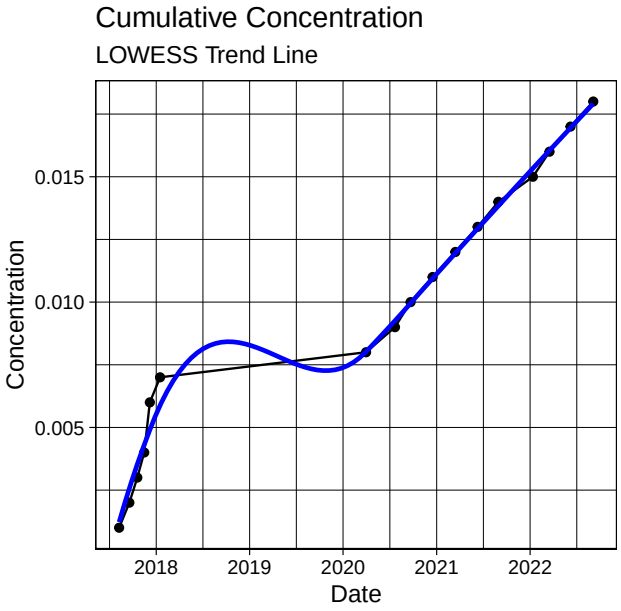




Kendall Trend Test Results Continuous	
n	17
z	-0.71
p	0.47
S	-8
varS	96
tau	-0.17
mean	0
sd	0
cov	0.23
results	STABLE

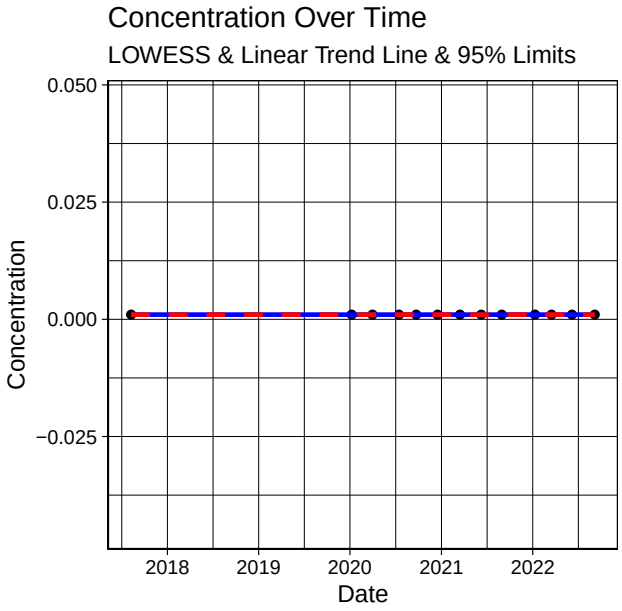
Report for ID : MW202 and Analyte : PFOA

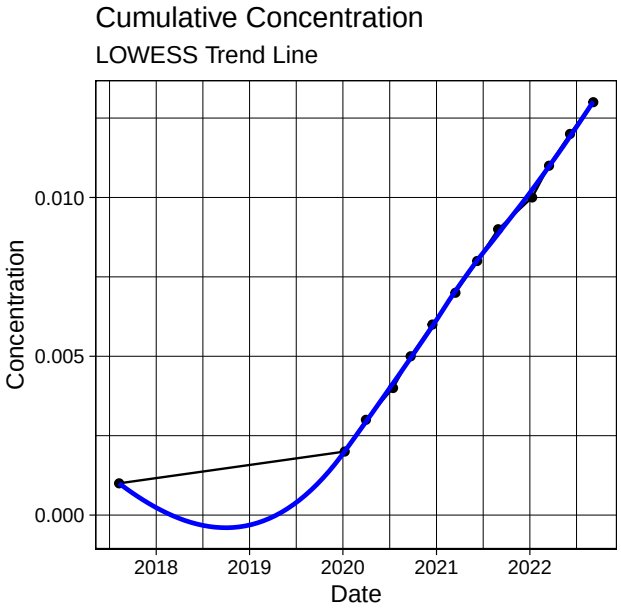




Kendall Trend Test Results Continuous	
n	13
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

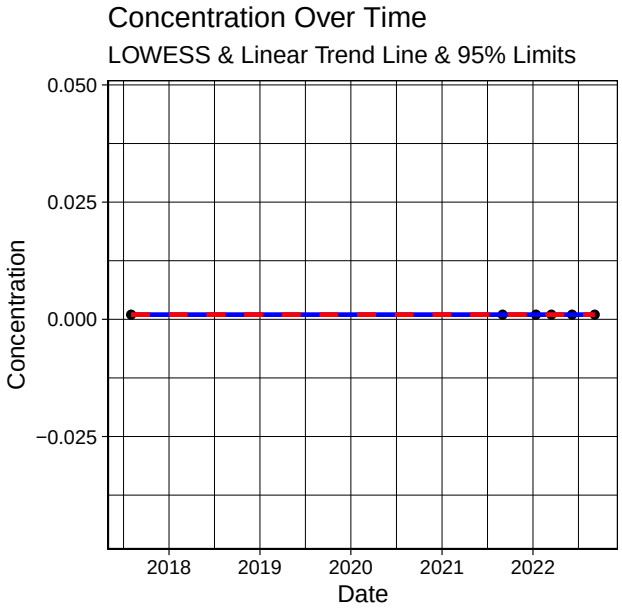
Report for ID : MW203 and Analyte : PFOA

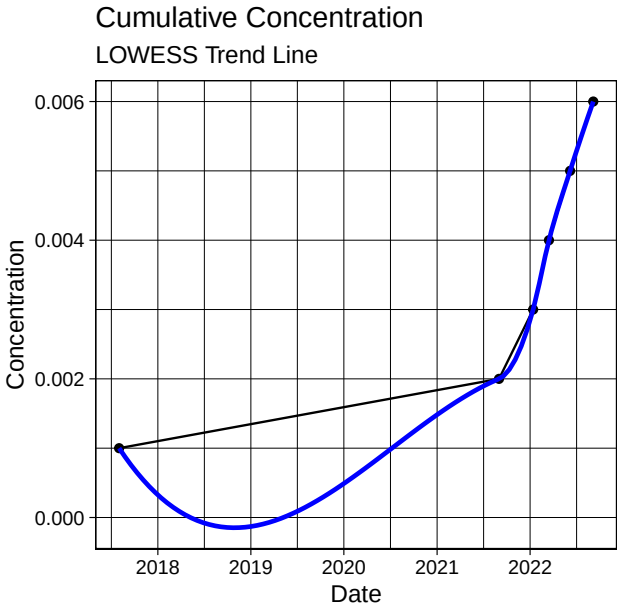




Kendall Trend Test Results Continuous	
n	6
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

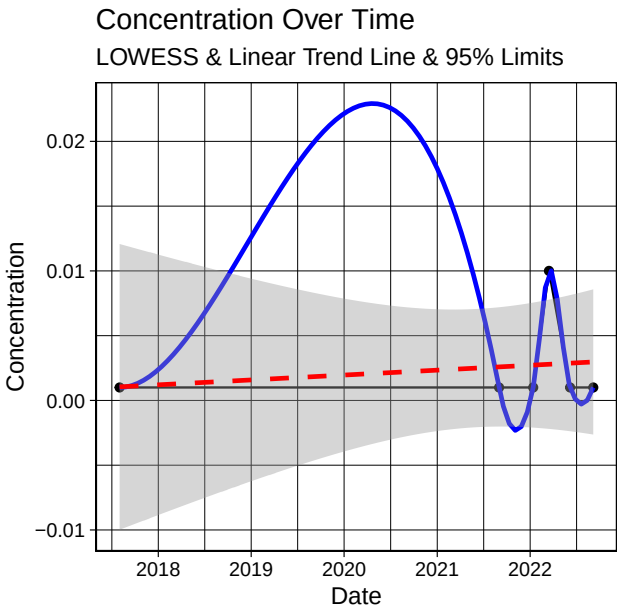
Report for ID : MW214 and Analyte : PFOA

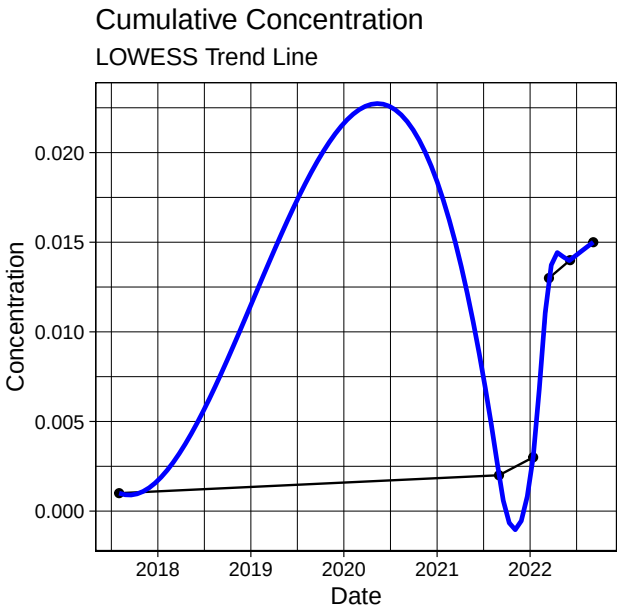




Kendall Trend Test Results Continuous	
n	6
z	0
p	1
S	1
varS	11.67
tau	0.12
mean	0
sd	0
cov	1.47
results	NO CLEAR TREND

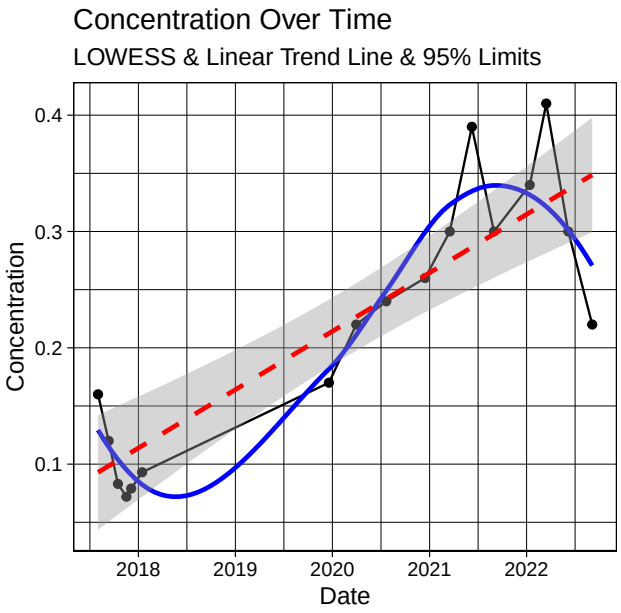
Report for ID : MW215 and Analyte : PFOA

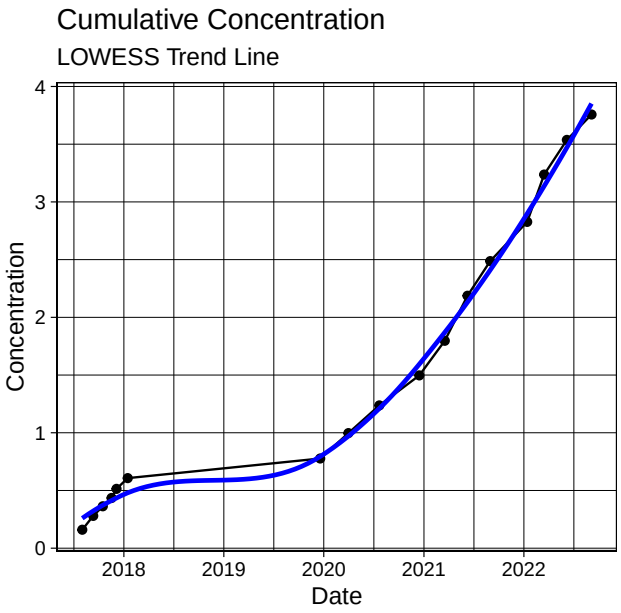




Kendall Trend Test Results Continuous	
n	17
z	3.43
p	0
S	84
varS	584.67
tau	0.63
mean	0.22
sd	0.11
cov	0.5
results	INCREASING

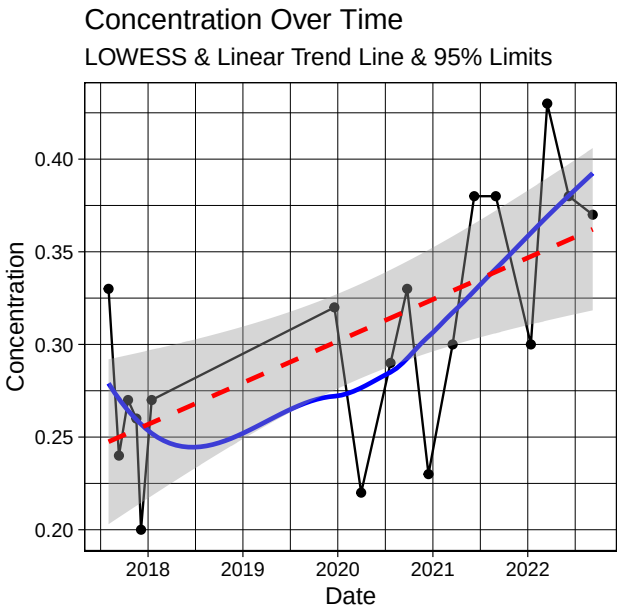
Report for ID : MW216 and Analyte : PFOA

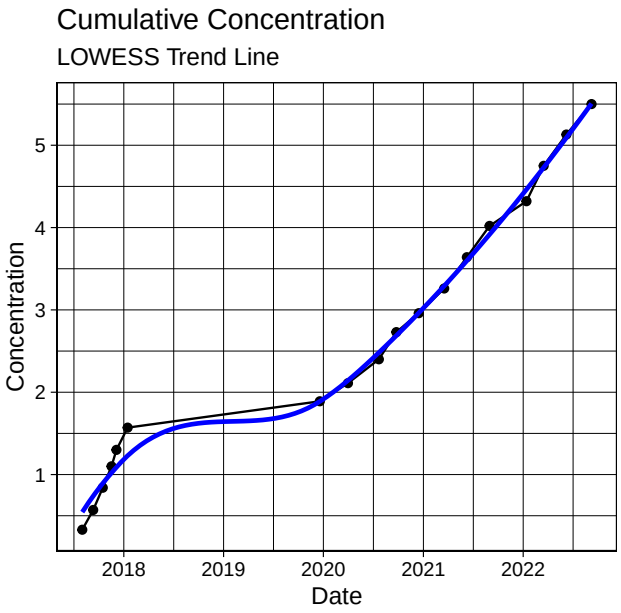




Kendall Trend Test Results Continuous	
n	18
z	2.59
p	0.01
S	69
varS	690.33
tau	0.46
mean	0.31
sd	0.06
cov	0.21
results	INCREASING

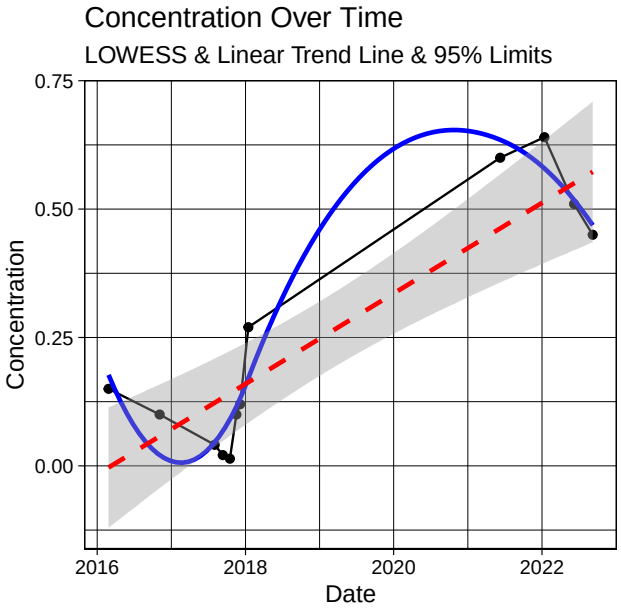
Report for ID : MW217 and Analyte : PFOA

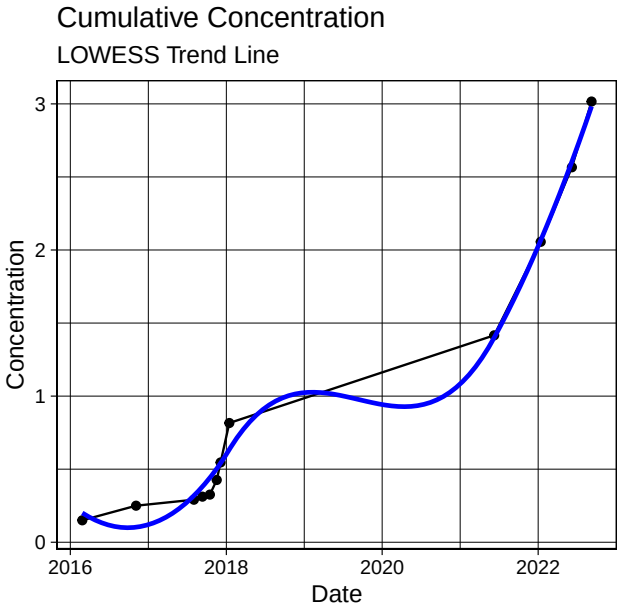




Kendall Trend Test Results Continuous	
n	12
z	2.06
p	0.04
S	31
varS	211.67
tau	0.47
mean	0.25
sd	0.23
cov	0.93
results	INCREASING

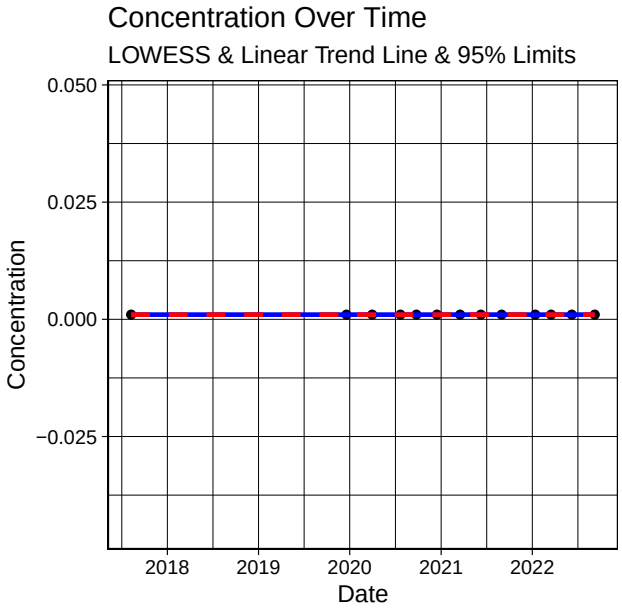
Report for ID : MW220 and Analyte : PFOA

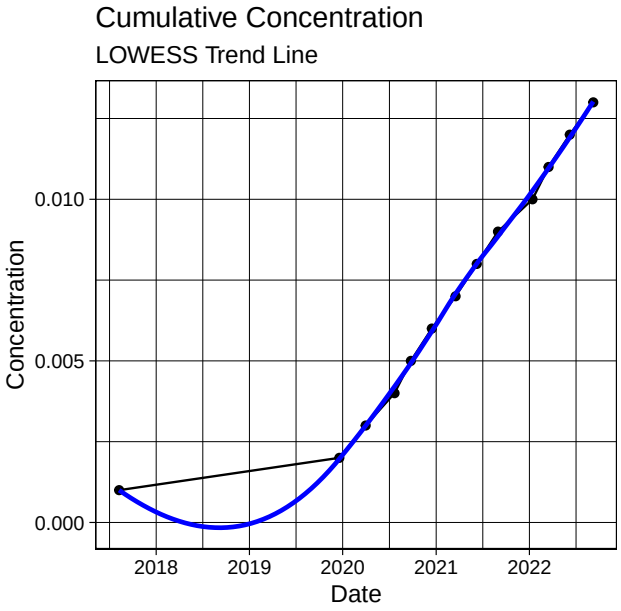




Kendall Trend Test Results Continuous	
n	13
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

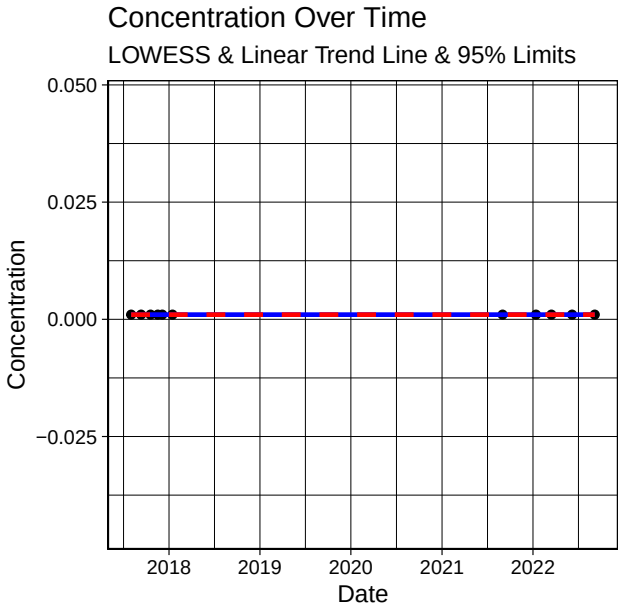
Report for ID : MW224 and Analyte : PFOA

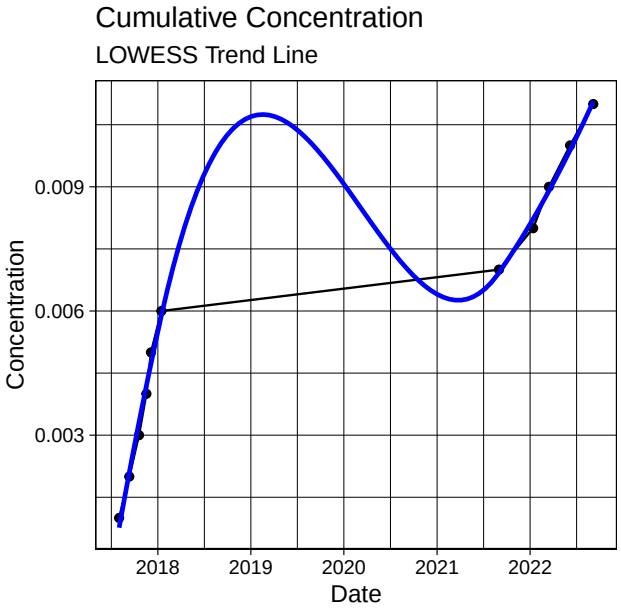




Kendall Trend Test Results Continuous	
n	11
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

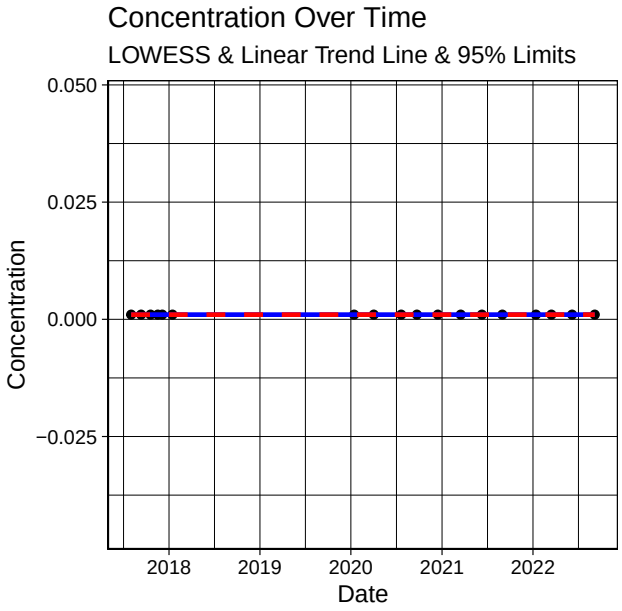
Report for ID : MW225 and Analyte : PFOA

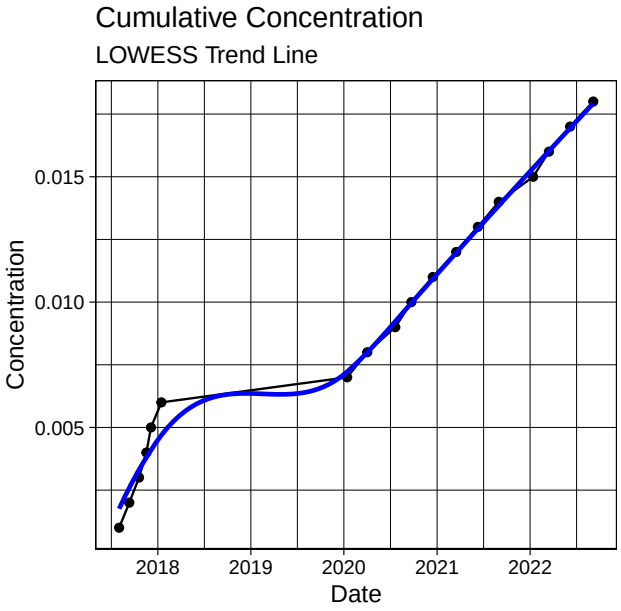




Kendall Trend Test Results Continuous	
n	18
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

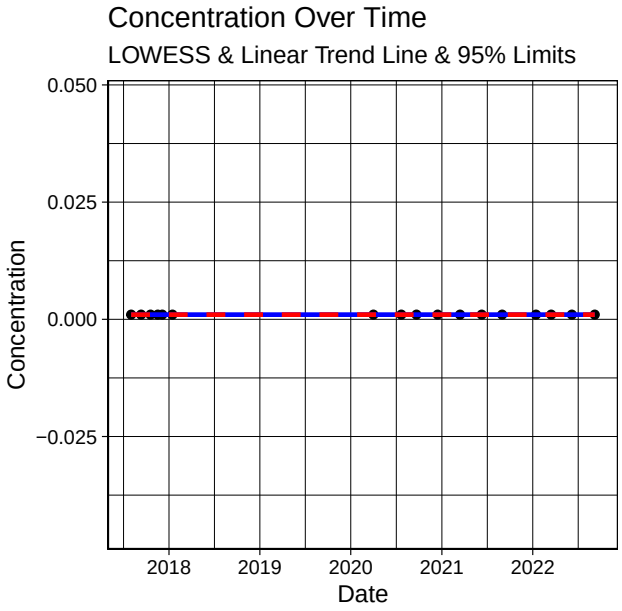
Report for ID : MW226 and Analyte : PFOA

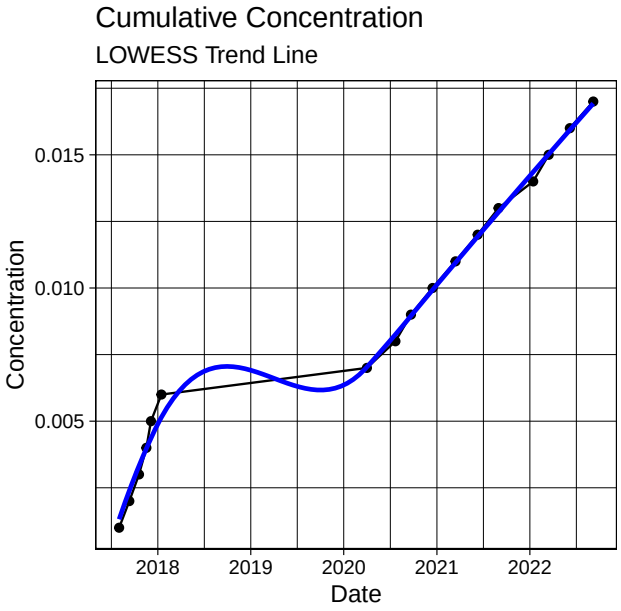




Kendall Trend Test Results Continuous	
n	17
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

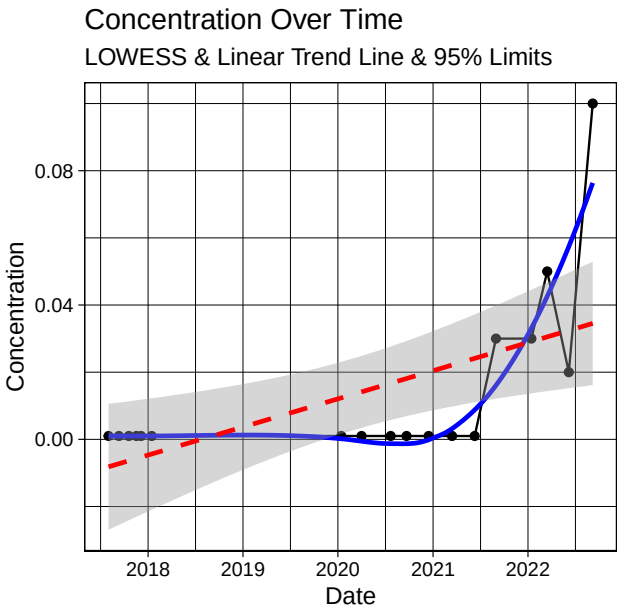
Report for ID : MW227 and Analyte : PFOA

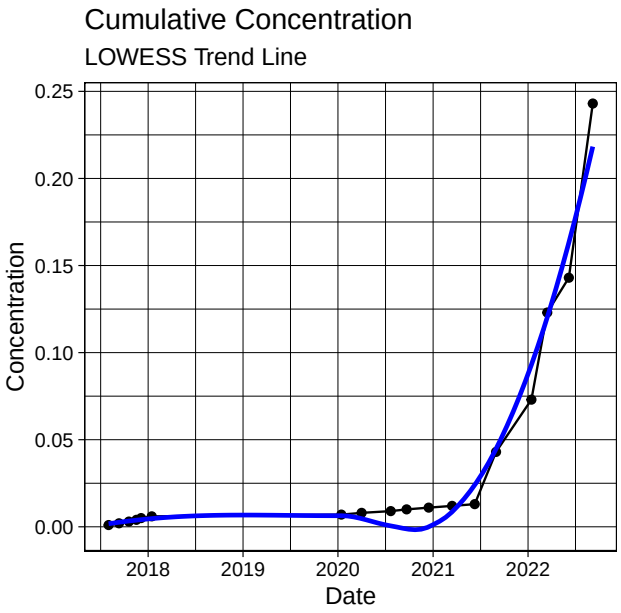




Kendall Trend Test Results Continuous	
n	18
z	3.24
p	0
S	68
varS	427.33
tau	0.64
mean	0.01
sd	0.03
cov	1.92
results	INCREASING

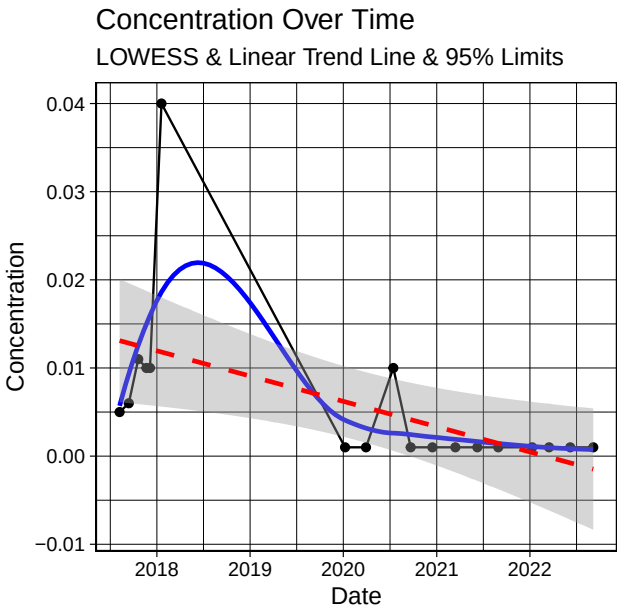
Report for ID : MW228 and Analyte : PFOA

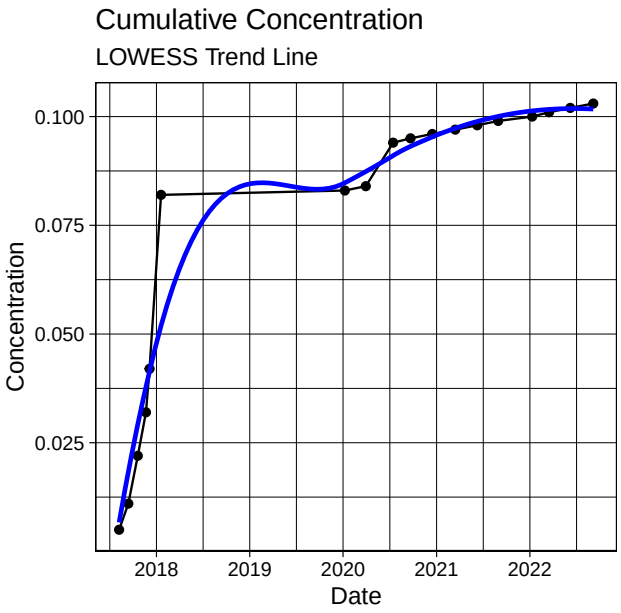




Kendall Trend Test Results Continuous	
n	18
z	-2.7
p	0.01
S	-63
varS	528.33
tau	-0.52
mean	0.01
sd	0.01
cov	1.64
results	DECREASING

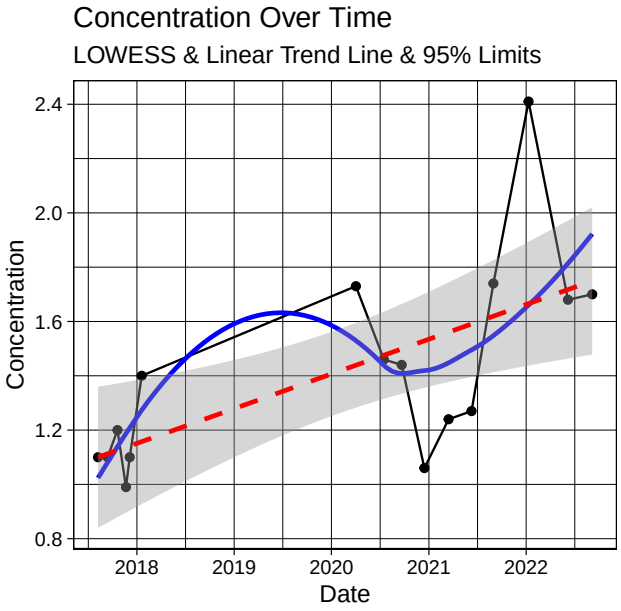
Report for ID : MW233 and Analyte : PFOA

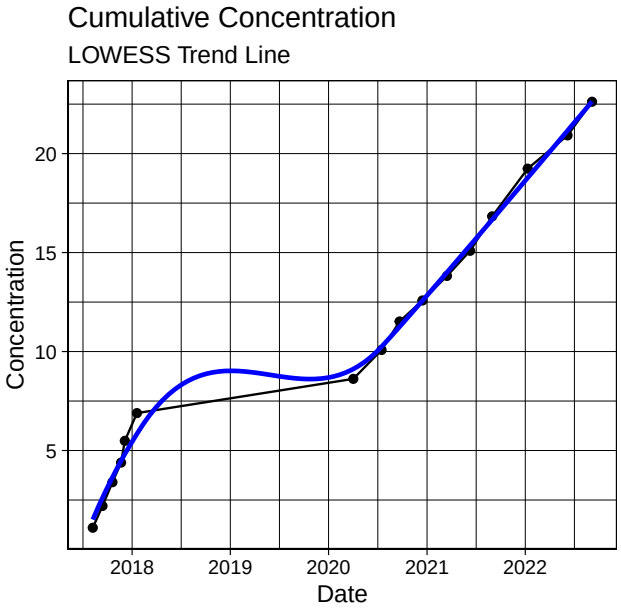




Kendall Trend Test Results Continuous	
n	16
z	2.62
p	0.01
S	59
varS	489.67
tau	0.5
mean	1.41
sd	0.37
cov	0.26
results	INCREASING

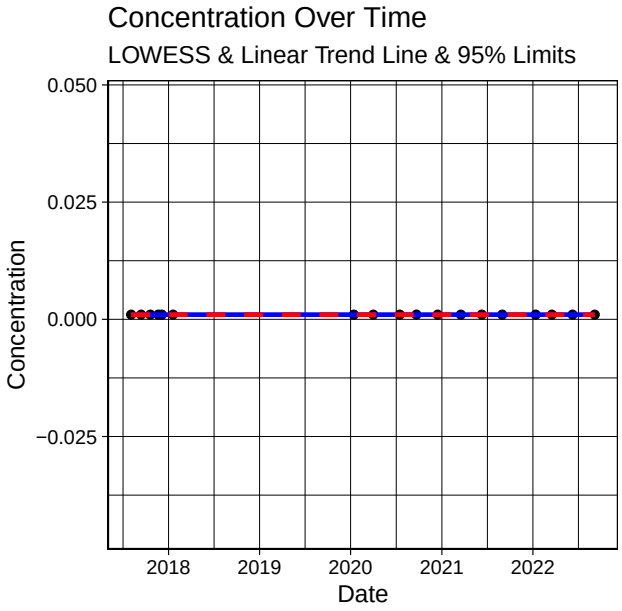
Report for ID : MW236 and Analyte : PFOA

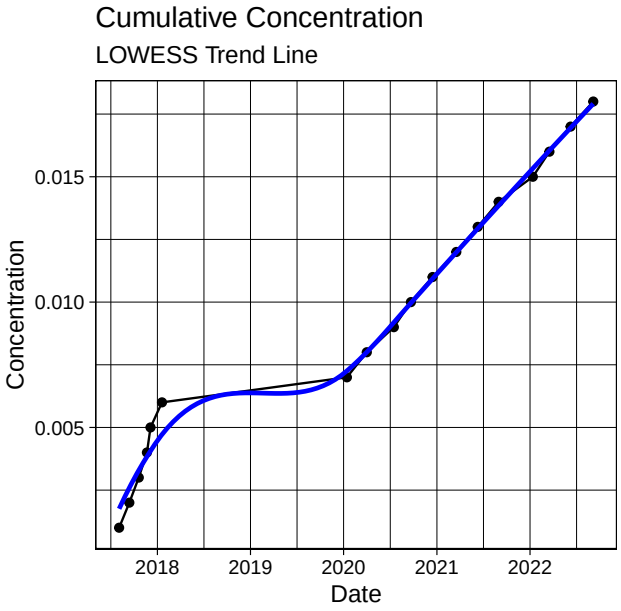




Kendall Trend Test Results Continuous	
n	18
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

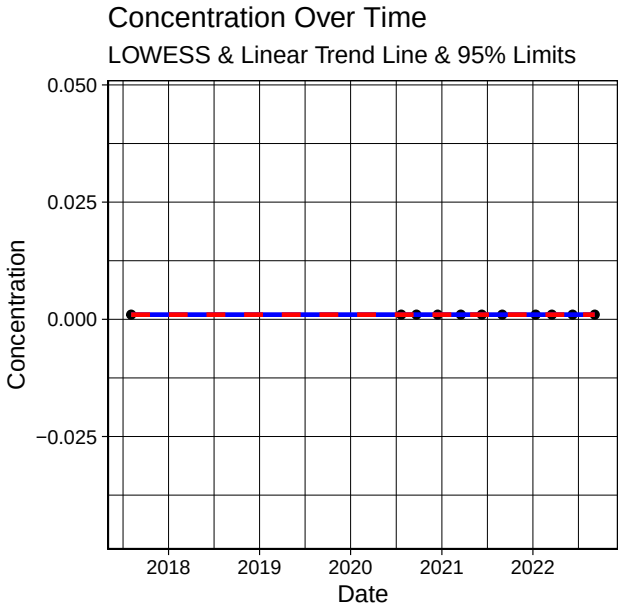
Report for ID : MW238 and Analyte : PFOA

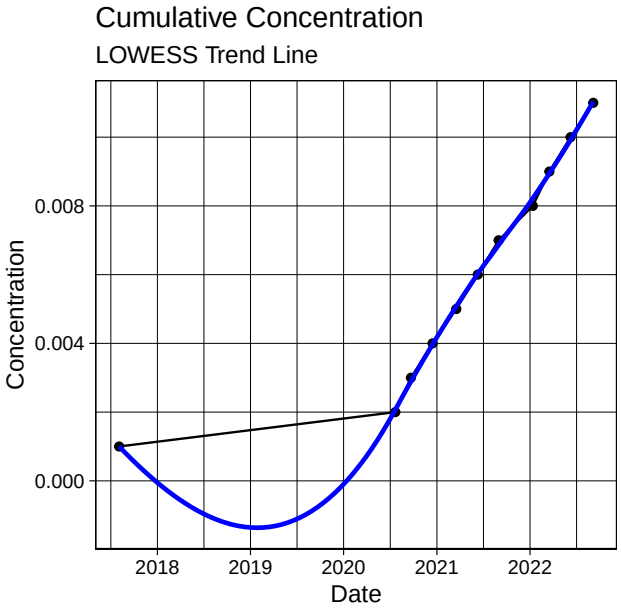




Kendall Trend Test Results Continuous	
n	11
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

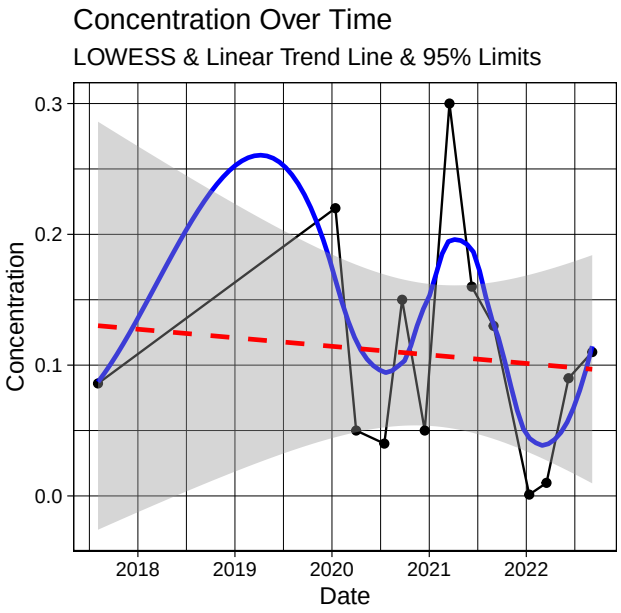
Report for ID : MW239 and Analyte : PFOA

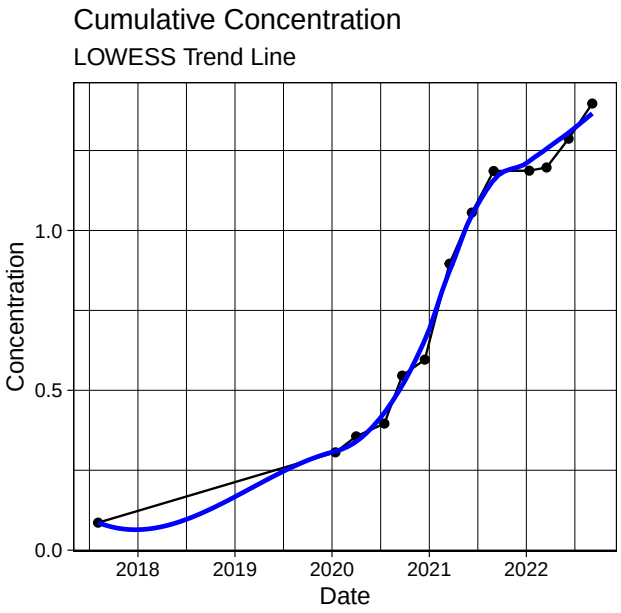




Kendall Trend Test Results Continuous	
n	13
z	-0.49
p	0.62
S	-9
varS	267.67
tau	-0.12
mean	0.11
sd	0.09
cov	0.79
results	STABLE

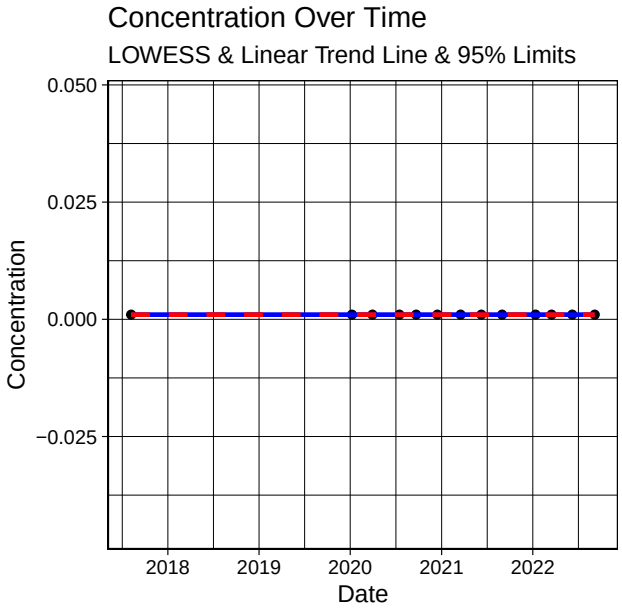
Report for ID : MW240 and Analyte : PFOA

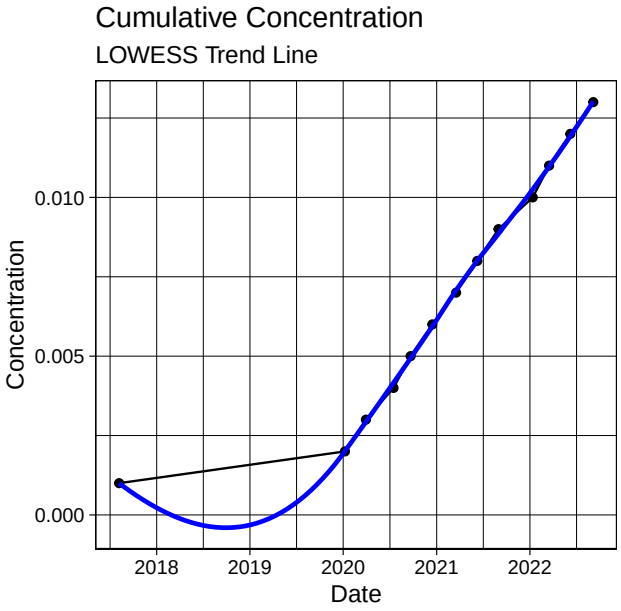




Kendall Trend Test Results Continuous	
n	13
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

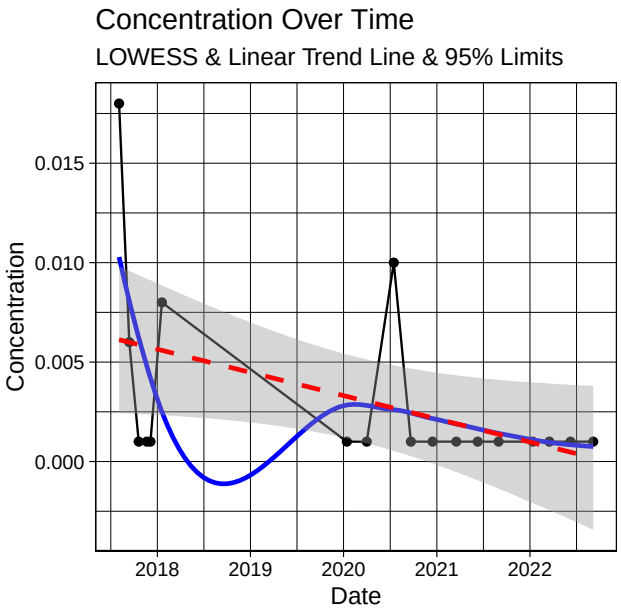
Report for ID : MW242 and Analyte : PFOA

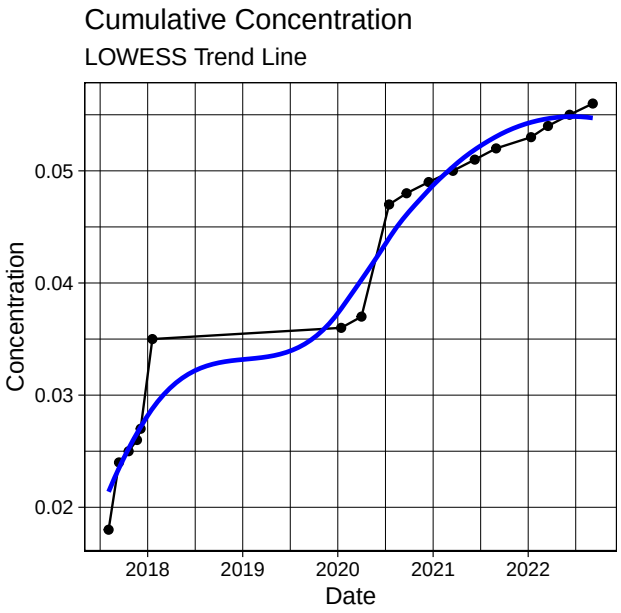




Kendall Trend Test Results Continuous	
n	18
z	-2.05
p	0.04
S	-40
varS	363.33
tau	-0.41
mean	0
sd	0
cov	1.49
results	DECREASING

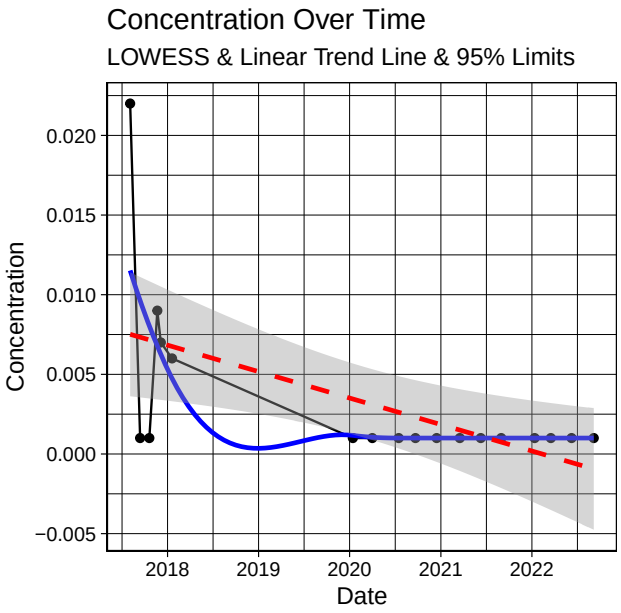
Report for ID : MW243 and Analyte : PFOA

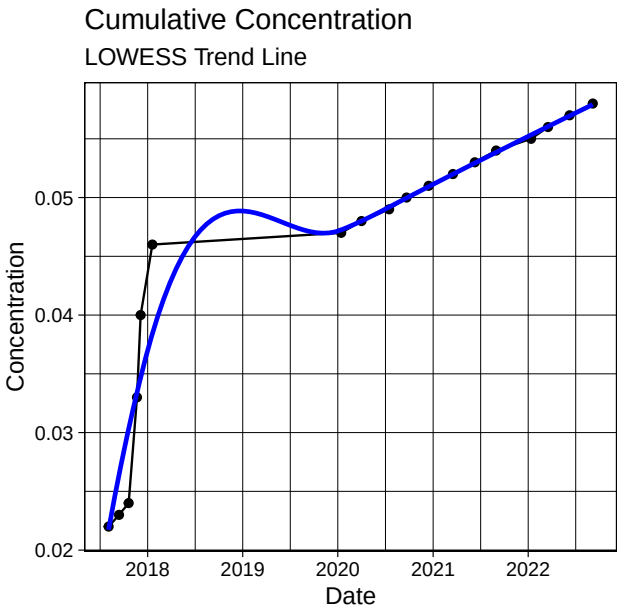




Kendall Trend Test Results Continuous	
n	18
z	-2.57
p	0.01
S	-50
varS	363.33
tau	-0.51
mean	0
sd	0.01
cov	1.64
results	DECREASING

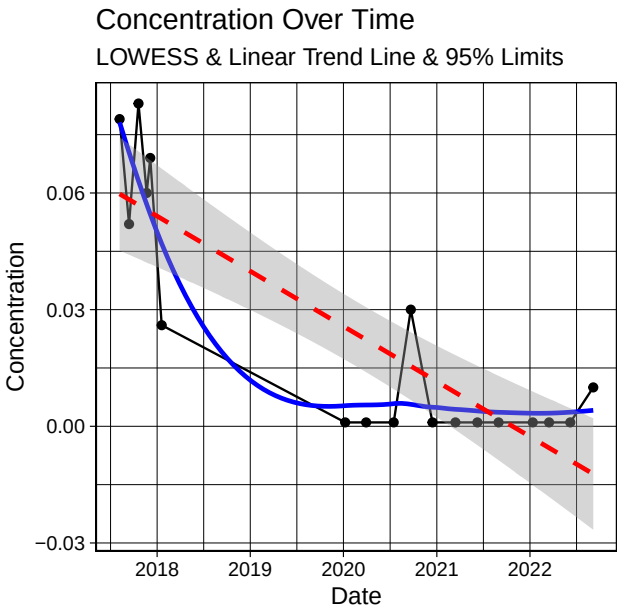
Report for ID : MW245 and Analyte : PFOA

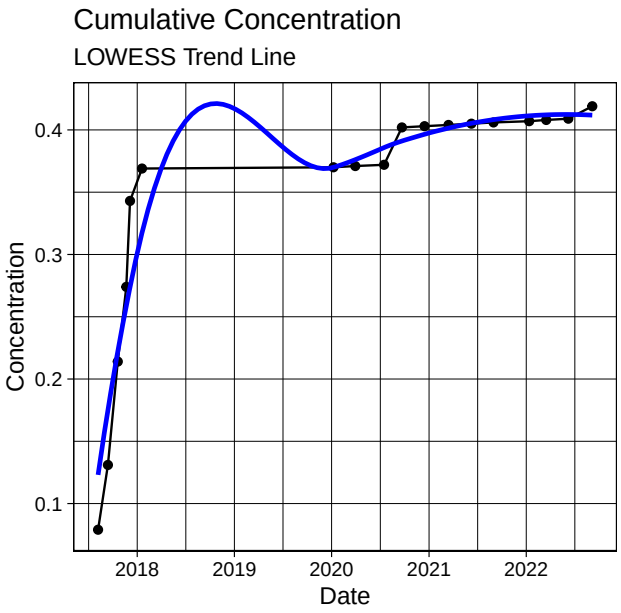




Kendall Trend Test Results Continuous	
n	18
z	-2.89
p	0
S	-70
varS	572
tau	-0.54
mean	0.02
sd	0.03
cov	1.32
results	DECREASING

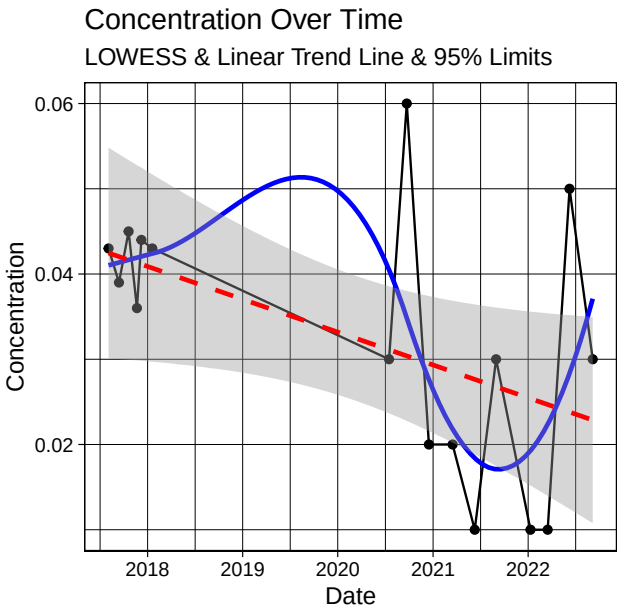
Report for ID : MW249 and Analyte : PFOA

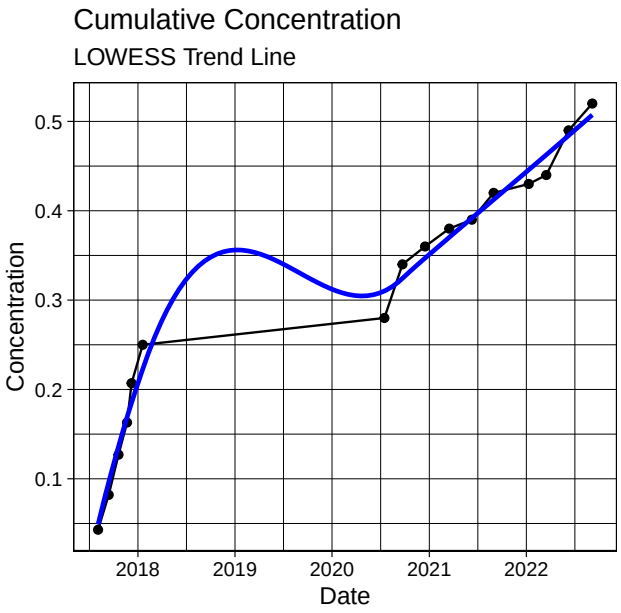




Kendall Trend Test Results Continuous	
n	16
z	-1.86
p	0.06
S	-42
varS	484
tau	-0.36
mean	0.03
sd	0.02
cov	0.47
results	POSSIBLY DECREASING

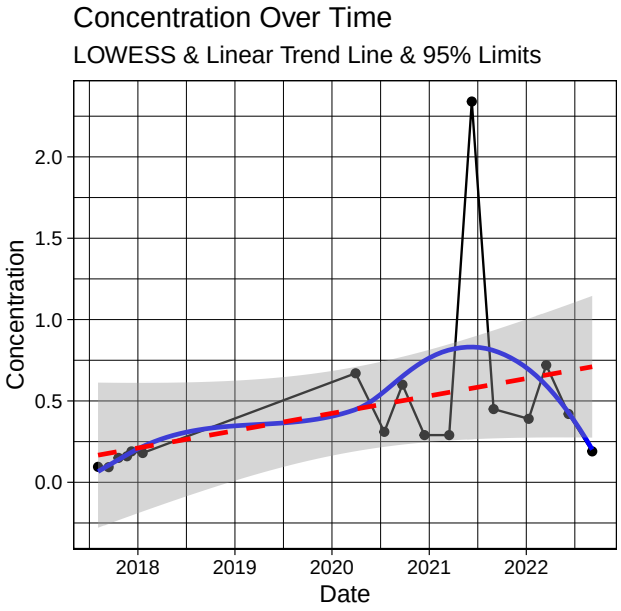
Report for ID : MW255 and Analyte : PFOA

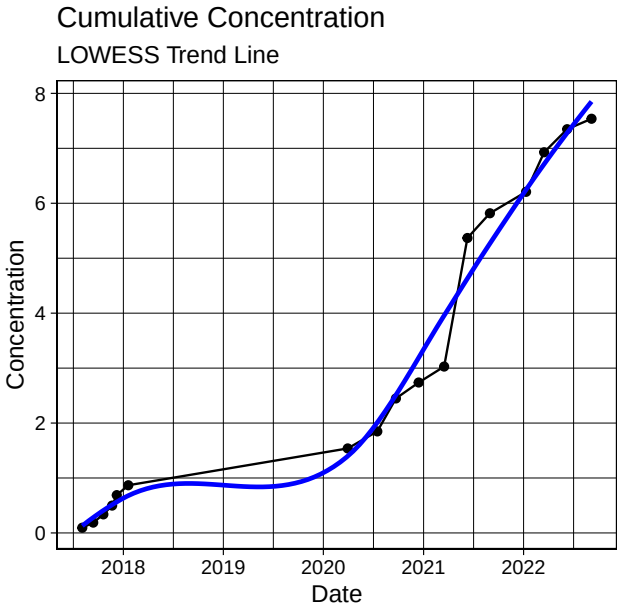




Kendall Trend Test Results Continuous	
n	17
z	2.76
p	0.01
S	68
varS	587.33
tau	0.5
mean	0.44
sd	0.53
cov	1.19
results	INCREASING

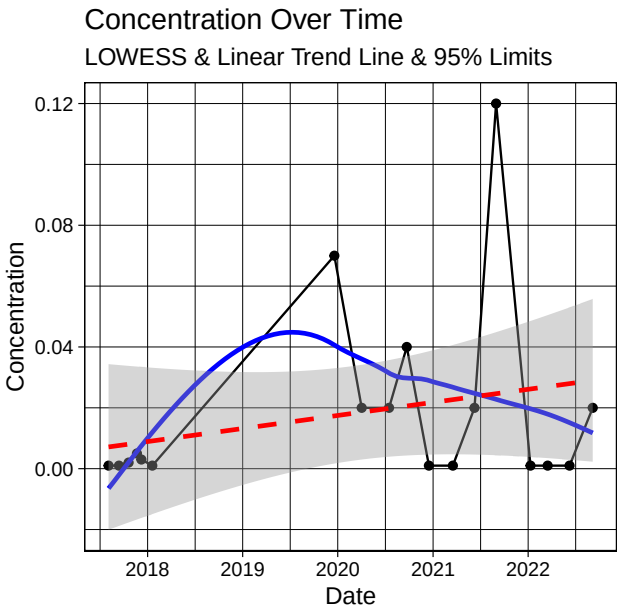
Report for ID : MW256 and Analyte : PFOA

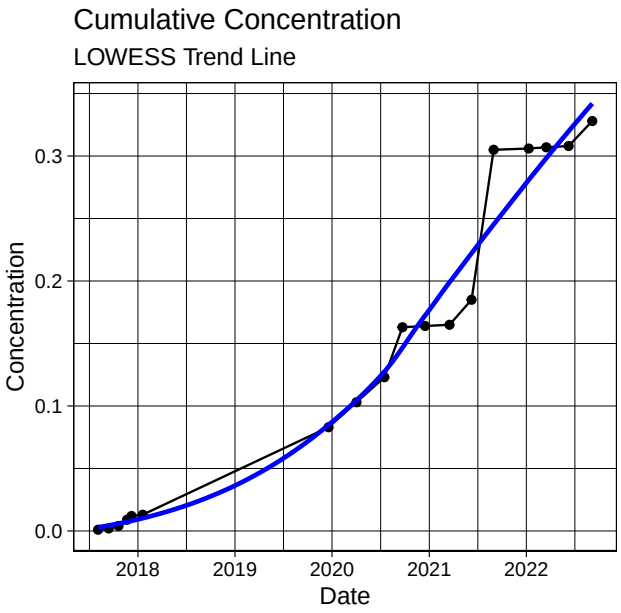




Kendall Trend Test Results Continuous	
n	18
z	0.48
p	0.63
S	13
varS	623
tau	0.1
mean	0.02
sd	0.03
cov	1.71
results	NO CLEAR TREND

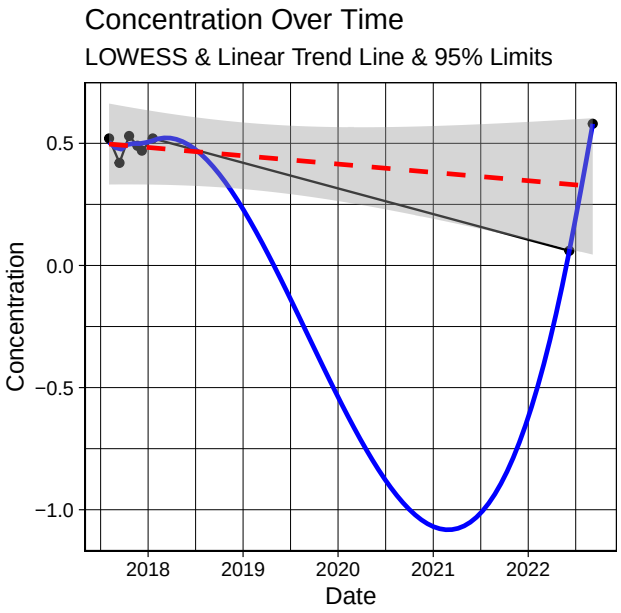
Report for ID : MW257 and Analyte : PFOA

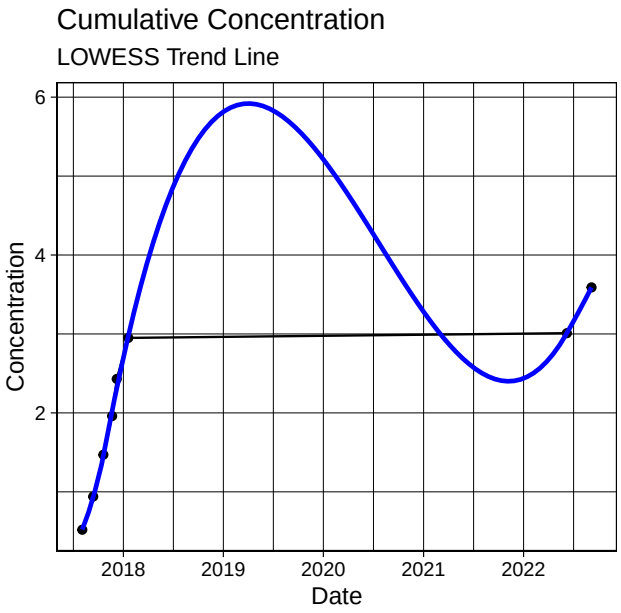




Kendall Trend Test Results Continuous	
n	8
z	0
p	1
S	1
varS	64.33
tau	0.04
mean	0.45
sd	0.16
cov	0.37
results	NO CLEAR TREND

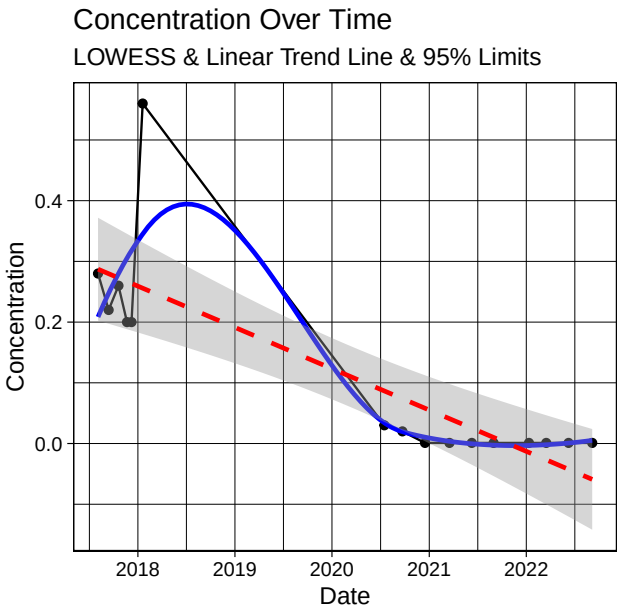
Report for ID : MW258 and Analyte : PFOA

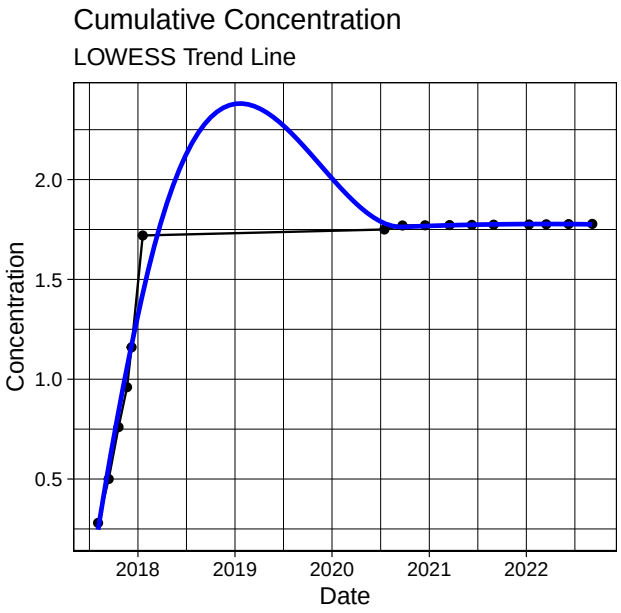




Kendall Trend Test Results Continuous	
n	16
z	-3.77
p	0
S	-79
varS	427
tau	-0.76
mean	0.11
sd	0.16
cov	1.45
results	DECREASING

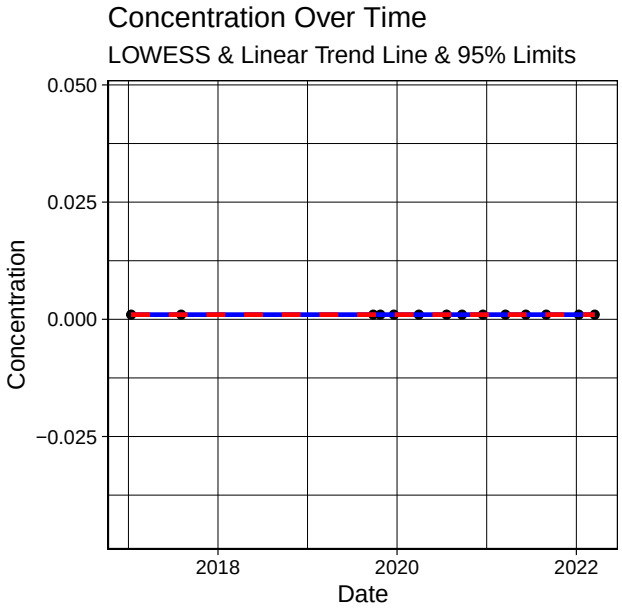
Report for ID : MW259 and Analyte : PFOA

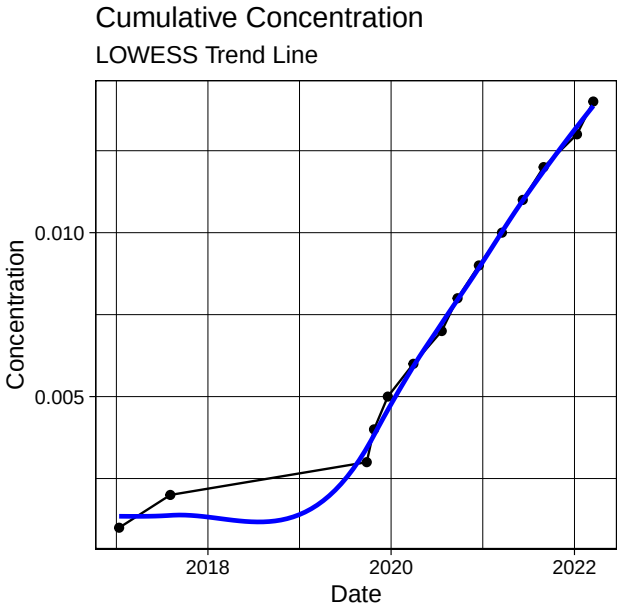




Kendall Trend Test Results Continuous	
n	14
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	0
results	NA

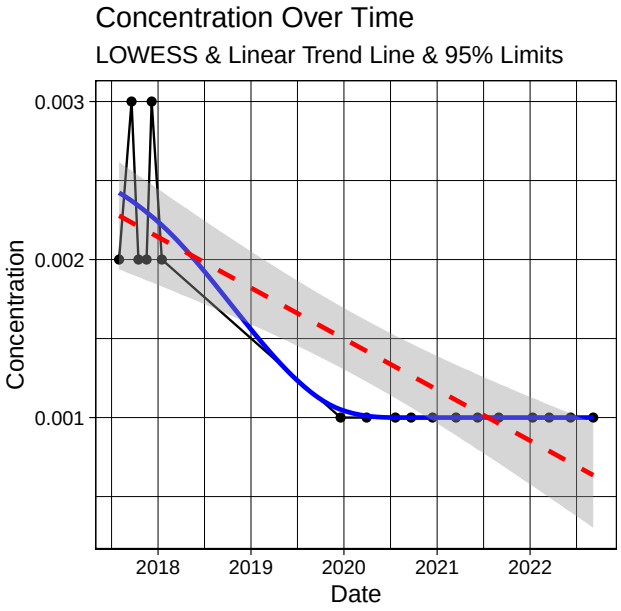
Report for ID : MW261 and Analyte : PFOA

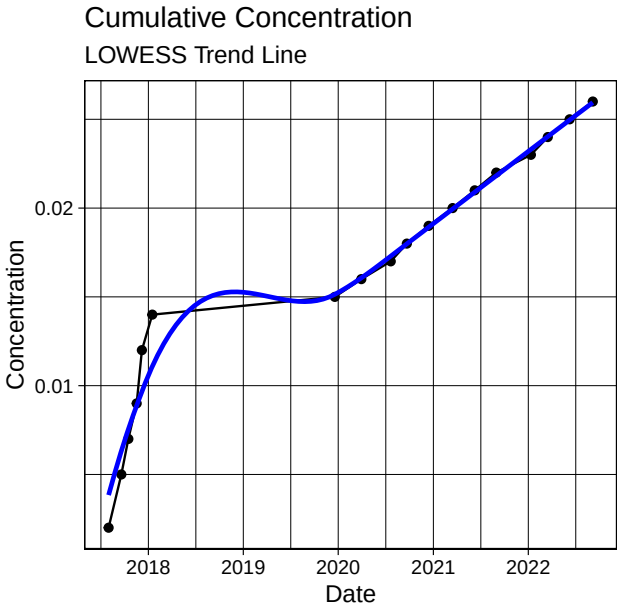




Kendall Trend Test Results Continuous	
n	18
z	-3.26
p	0
S	-72
varS	474.67
tau	-0.65
mean	0
sd	0
cov	0.49
results	DECREASING

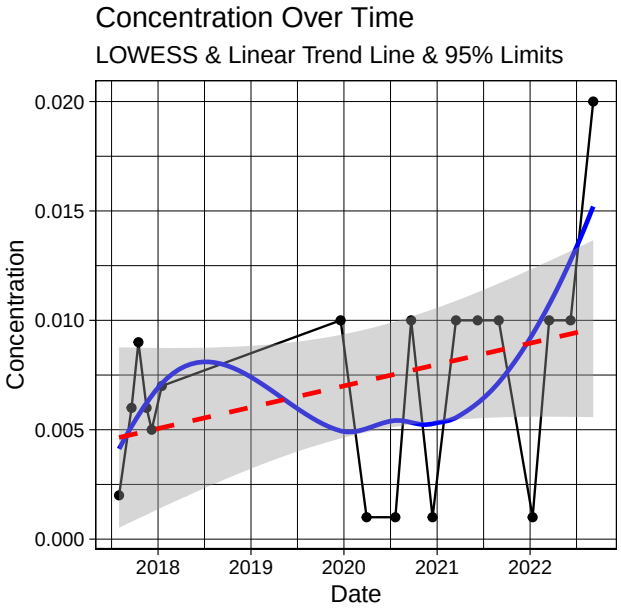
Report for ID : MW268 and Analyte : PFOA

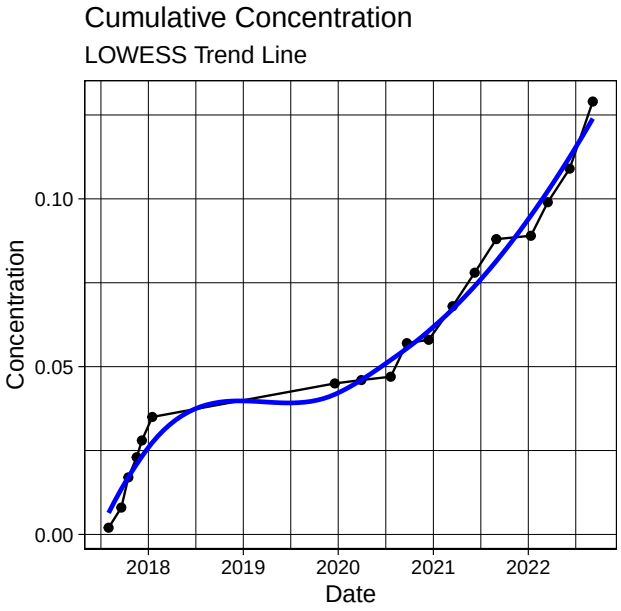




Kendall Trend Test Results Continuous	
n	18
z	1.89
p	0.06
S	49
varS	643
tau	0.35
mean	0.01
sd	0
cov	0.69
results	POSSIBLY INCREASING

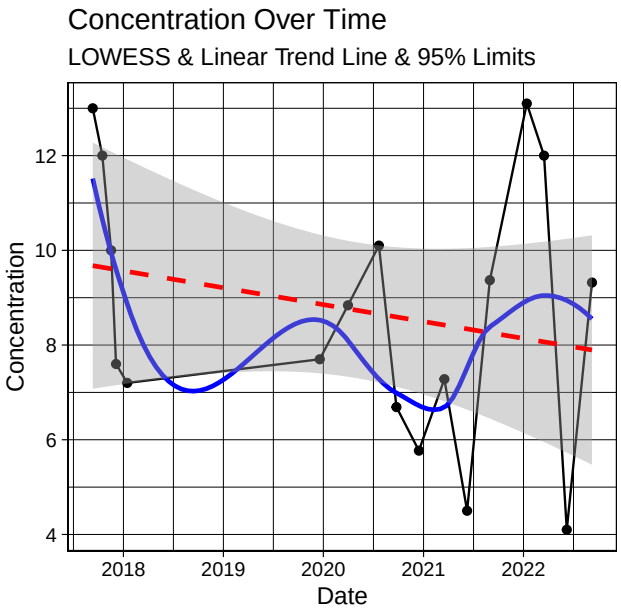
Report for ID : MW269 and Analyte : PFOA

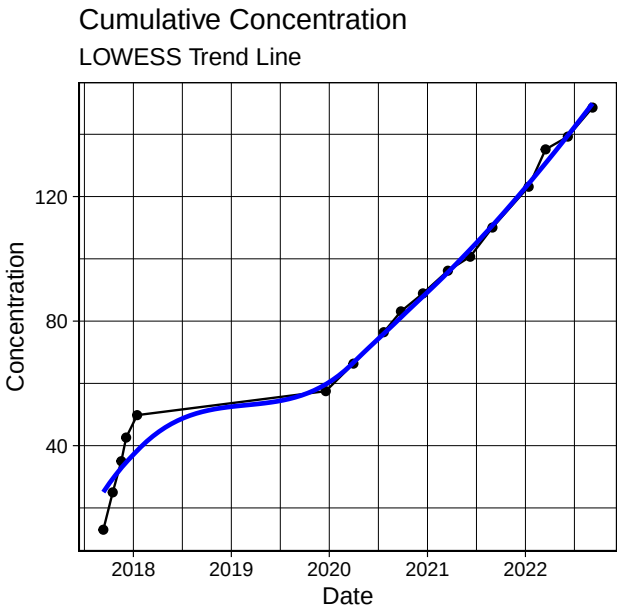




Kendall Trend Test Results Continuous	
n	17
z	-1.07
p	0.28
S	-27
varS	588.33
tau	-0.2
mean	8.74
sd	2.76
cov	0.32
results	STABLE

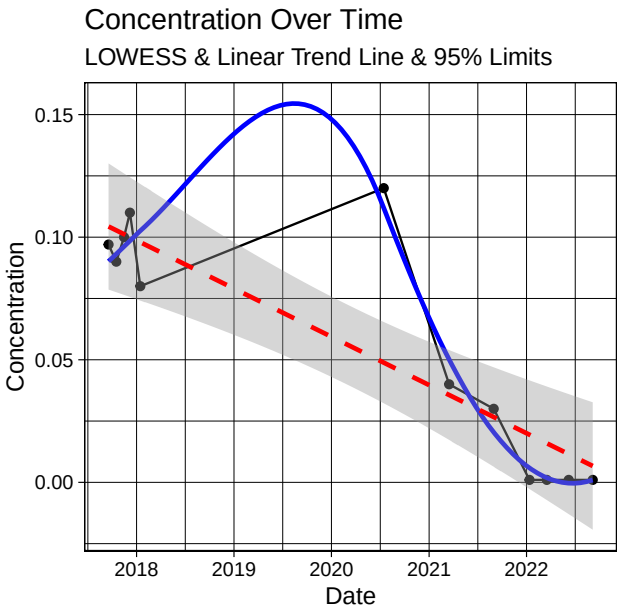
Report for ID : MW282 and Analyte : PFOA

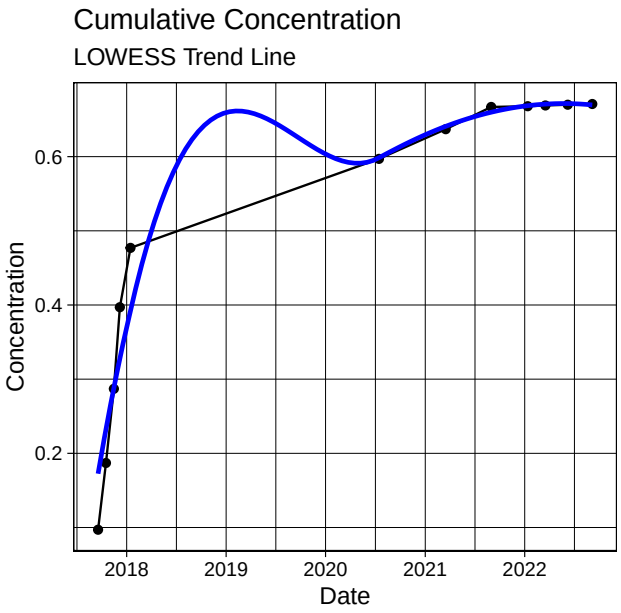




Kendall Trend Test Results Continuous	
n	12
z	-2.73
p	0.01
S	-40
varS	204
tau	-0.64
mean	0.06
sd	0.05
cov	0.86
results	DECREASING

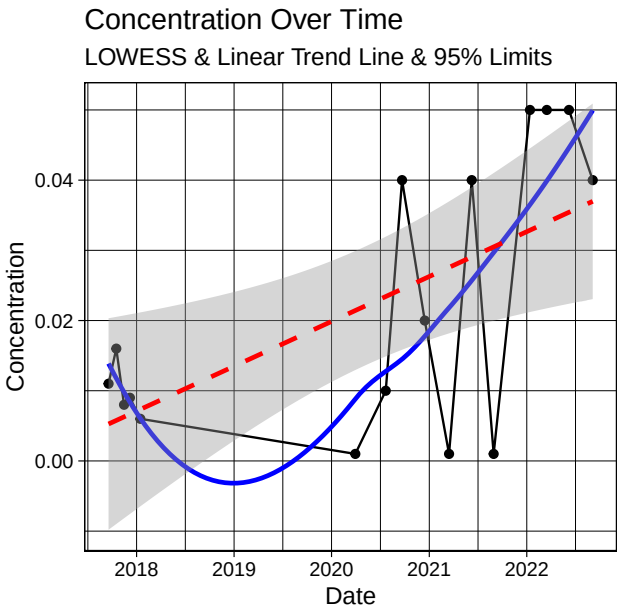
Report for ID : MW288 and Analyte : PFOA

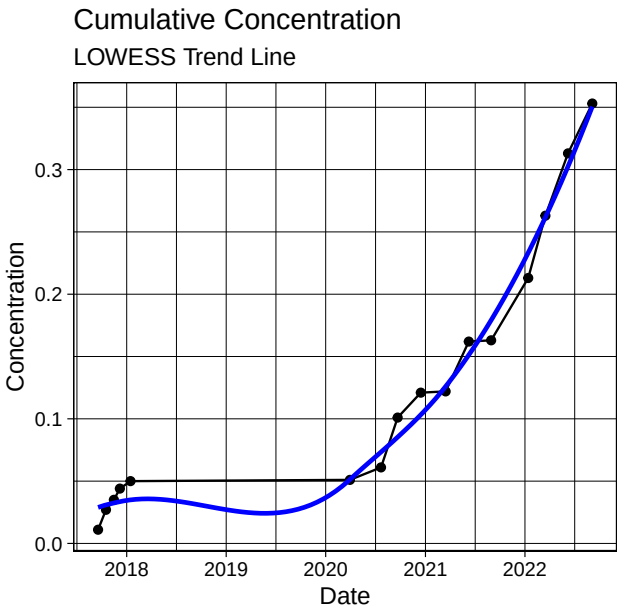




Kendall Trend Test Results Continuous	
n	16
z	1.73
p	0.08
S	39
varS	482.33
tau	0.34
mean	0.02
sd	0.02
cov	0.87
results	POSSIBLY INCREASING

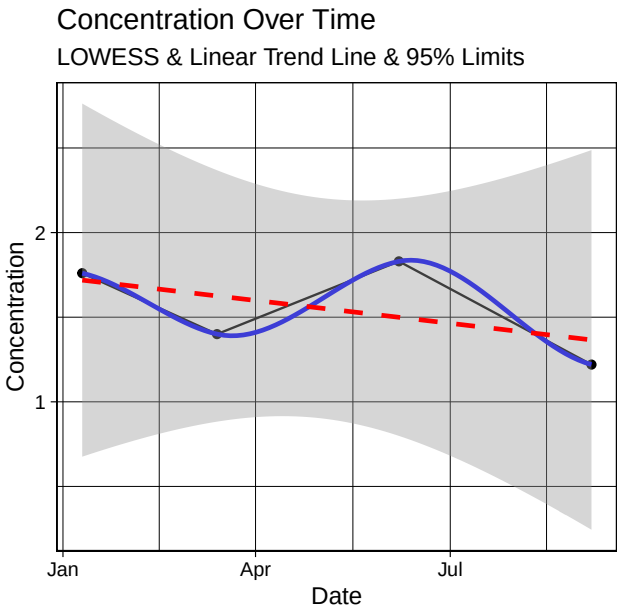
Report for ID : MW289 and Analyte : PFOA

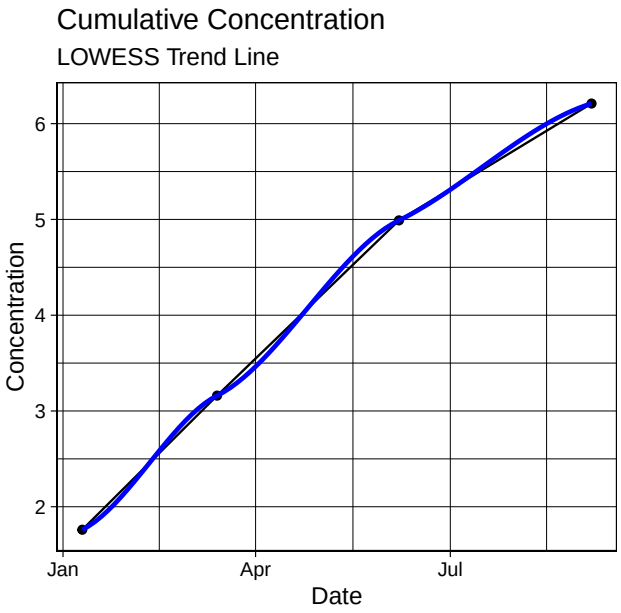




Kendall Trend Test Results Continuous	
n	4
z	-0.34
p	0.73
S	-2
varS	8.67
tau	-0.33
mean	1.55
sd	0.29
cov	0.19
results	STABLE

Report for ID : MW500 and Analyte : PFOA





Kendall Trend Test Results Continuous	
n	11
z	-0.39
p	0.7
S	-6
varS	164
tau	-0.11
mean	0.1
sd	0.05
cov	0.54
results	STABLE

Report for ID : MW516 and Analyte : PFOA

